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Plant Biology Personnel and Training at Doctorate-granting Institutions

Charles J. Andersen

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HIGHLIGHTS

- Research support in plant biology totaled a little more than $200 million in fiscal year 1983. The federal government provided nearly half of these funds (48 percent); the state governments, about one-third (34 percent); and industry one-tenth (10 percent).
- Molecular biology was the discipline most frequently cited as having a shortage of personnel. Ecology was most frequently identified as the specialty that had a surplus of personnel.
- Ecology was the area of concentration that ranked highest for graduate study and faculty research. Plant physiology was ranked highest for postdoctorate research and/or study.
- Land-grant institutions predominate in all areas of academic plant biology. They account for 83 percent of the research support; 80 percent of the faculty, students, and doctorates, and 72 percent of the postdoctorates.
- Over 4,700 full-time plant biology faculty were in departments involved in training graduate students in the field at the nation's principal doctorate-granting institutions.
- Just over 8,000 full-time students were in graduate plant biology programs at major doctorate-granting institutions in fall 1982.
- The primary source of support for nearly one-third of the graduate students in plant biology came from the institutions themselves. Federal sources provided the primary support for nearly one-quarter of the students, state governments for one-eighth, and industry for less than one-tenth.
- Over 900 doctorates were awarded in academic year 1982-83 in disciplines that comprised plant biology.
- One thousand postdoctorate fellows or associates were studying and/or conducting research in plant biology during the 1982-83 academic year.

Women represented 31 percent of the graduate students, 29 percent of the postdoctorates, 21 percent of the doctorates awarded, and 7 percent of the faculty in graduate plant biology programs.

Members of racial/ethnic minorities comprised 4 percent of the faculty in graduate plant biology programs, and 5 percent of the doctorates awarded in 1982-83. Seven percent of the U.S. graduate students and 10 percent of the postdoctorates in plant biology in 1982-83 were racial/ethnic minority group members.

Foreign students with temporary visas represented 20 percent of the full-time graduate students and 33 percent of the postdoctorates in plant biology. Three-quarters (77 percent) of these foreign graduate students and two-fifths (39 percent) of the foreign postdoctorate fellows came from developing countries.

BACKGROUND

Various recent studies and reports have emphasized the importance of plant biology research. In 1983, the National Academy of Sciences Briefing Panel on Agricultural Research Opportunities identified plant biology specifically as a research area that is likely to return the highest scientific dividends as a result of incremental federal investments. The National Science Board is devoting special attention to plant biology since it is expected to produce the scientific discoveries essential to agricultural advances in the next century.

Planning major research programs requires accurate information about funding and personnel. Reliable baseline data for plant biology have not been available. To develop such data, the National Science Foundation asked the Higher Education Panel to measure the total plant biology effort in terms of students, faculty, researchers, and research funding at those doctorate-granting institutions with graduate programs in the field. Though much activity in plant biology occurs at the undergraduate level, in this first effort to gather basic information, the decision was to focus on the major graduate institutions, where most of tomorrow's professoriate is prepared and where most of the research is being conducted.

FINDINGS

These findings are national estimates based on responses from 143 of the 165 major doctorate-granting institutions that had graduate programs in plant biology in fall, 1982. A description of the data-gathering procedure is found in the Methods Summary section, which follows these findings, and in Appendix B, Technical Notes.

Research Support

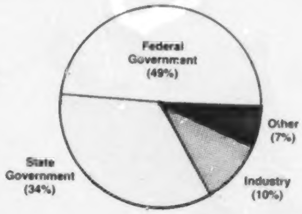
Research support totaling $201.6 million was received by the 165 doctorate-granting institutions covered by this survey. The federal government provided $98 million, or nearly half of that total. This 1983 federal contribution equals about one-twelfth of the federal research and development funds for the biological and agricultural sciences for 1982 as reported by the National Science Foundation.[1]

State governments provided just over one-third of the plant biology research support; industry provided one-tenth (see figure 1).

Figure 1

Sources of Research Support for Plant Biology, FY 1983

Total: $201 million



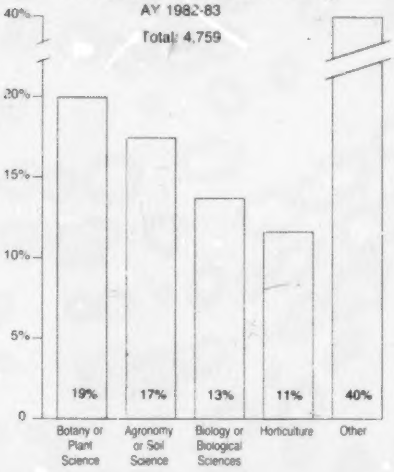
Four-fifths of these research support funds went to land-grant institutions. They received nearly all of the funds (98 percent) provided by the state governments, and three-quarters of those provided by the federal government, industry, and other sources.

Faculty

A total of 4,760 full-time plant biology faculty were in departments involved in training graduate students in the field. Nineteen percent of these faculty were in botany or plant science departments; 17 percent were in agronomy and soil science departments; 13 percent were in biology or biological science departments; and 10 percent were in horticulture departments. The remaining 40 percent of the faculty were spread among departments of plant pathology; forestry; plant and soil science; biochemistry; genetics; chemistry; marine sciences/oceanography; and other. None of these departments accounted for as much as 10 percent of the total faculty.

Figure 2

Plant Biology Faculty, by Department


AY 1982-83

Total: 4,759

Overall, about 8 of 10 plant biology faculty were directly involved in training graduate students. However, that proportion varied somewhat by department. In departments of botany or plant science, 83 percent of the faculty were teaching graduate students, in contrast to 71 percent in departments of plant and soil science and 73 percent in departments of horticulture and agronomy and soil science (see table A). Faculty in these departments are primarily at land-grant institutions, where research and extension are major activities.

TABLE A--Percentage of Plant Biologists Training Graduate Students, by Department, AY 1982-83

Department	Percentage Training Graduate Students at All Institutions	Percentage Training Graduate Students at Land-grant Institutions
All departments	81%	79%
Botany/plant science	83	81
Biology/biological sciences	83	81
Plant pathology	82	82
Forestry	79	79
Agronomy and soil science	73	74
Horticulture	73	73
Plant and soil science	71	69

Note: Only those department names with totals of more than 150 plant biologists are listed.

Reference: Table 2A

A total of 4,610 faculty were reported in the plant biology programs conducted at the 165 institutions covered by the survey.[2] Women represented 7 percent of this faculty. Members of minority racial/ethnic groups make up 4 percent of the total.

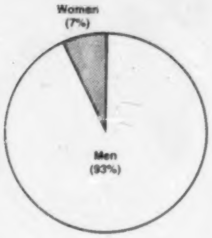
---

[1] National Science Foundation (NSF), Academic Science R&D Funds, FY 1982, Detailed Statistical Tables (Washington: NSF, 1984).

[2] The 3 percent difference between "departmental" and the "program" counts (4,759 vs. 4,607) may be due to the elimination from the latter of plant biologists in departments that were peripheral to some institutions' formal plant biology graduate programs.

Figure 3

Plant Biology Faculty by Sex
AY 1982-83
Total: 4,759



Faculty Vacancies

Forty-one percent of the institutions reported at least one full-time faculty vacancy in their plant biology programs as of the fall of 1983. Nearly 215 vacancies were reported, or 4 percent of the departmental faculty count.

Eighteen institutions reported that molecular biology was the discipline in which the need to replace faculty was the greatest. Eight institutions identified horticulture/crop science as the neediest field; 7 noted agronomy/soil science; and 5, plant physiology. The remaining 29 institutions had faculty vacancies spread among various other disciplines, such as anatomy/ morphology; biochemistry; developmental biology; and plant pathology. None of these disciplines was cited by more than 4 institutions as being in greatest need of being filled.

Almost half of the institutions reporting vacancies identified research opportunities as being the most important reason for filling the vacancy(ies) in the discipline with the greatest need. Another one-third identified faculty retirements/ departures as the most important reason. Not known is whether institutions were using (as they sometimes do) the existence of a vacancy to take advantage of research opportunities in certain disciplines to fill a vacancy, rather than replacing a retiring faculty member in one discipline with another in the same discipline.

Postdoctorates

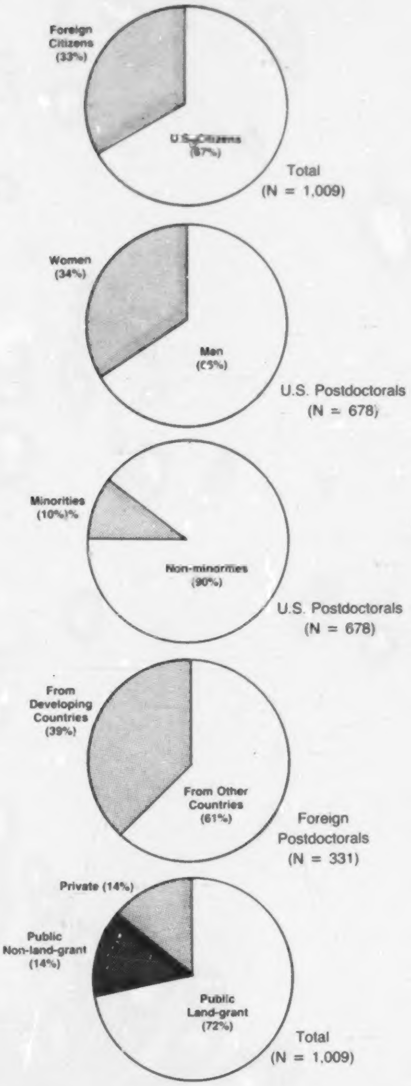
In 1982-83, postdoctoral fellows or associates in plant biology numbered just over 1,000 nationally. Essentially the same number of postdoctorates (1,020) were expected in 1983-84.

Two-thirds of the postdoctorates were U.S. citizens. Of these, 1 out of 3 was a woman; and 1 of 10 was a member of a racial/ethnic minority group.

One-third of the fellows were foreign citizens with temporary visas for the United States. Of these foreign postdoctorates, two-fifths came from developing countries.

Figure 4

Postdoctoral Fellows/Associates in Plant Biology
AY 1982-83

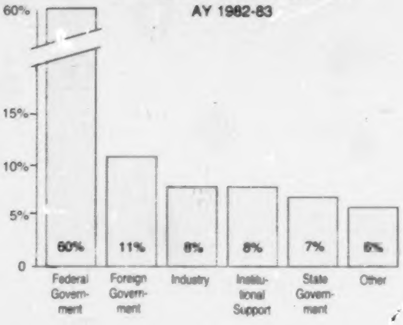


About three-quarters (72 percent) of the postdoctorates were at land-grant institutions. These colleges and universities had essentially the same share of all the foreign postdoctorates with temporary visas (75 percent) but a somewhat smaller share (65 percent) of the postdoctorates from developing countries.

Three of 5 postdoctorates in plant biology received their major support from the federal government--either through fellowship assistance or research grants. Foreign governments were the second most important source, providing support for one-tenth of all postdoctorates. If one assumes that foreign governmental assistance is confined to postdoctorates with temporary visas, then as many as a third of the foreign postdoctorates would have received their major support from foreign governments.

Industry and institutional support each provided major support to 8 percent of the postdoctorates; state governments, to 7 percent (see figure 5).

Figure 5
Sources of Major Support for Postdoctoral Fellows/Associates
AY 1982-83



Graduate Students

An estimated 8,000 graduate students were enrolled in plant biology programs in academic year 1982-83. About the same number were expected to be in these programs in the 1983-84 academic year.

U.S. citizens (and foreign nationals with permanent visas for the United States) made up four-fifths of this graduate enrollment. Two-thirds of these U.S. students were male; one-third were female; less than one-tenth were members of racial/ethnic minority groups.[3] Land-grant institutions enrolled 80 percent of all graduate students.

Twenty percent of the graduate students were foreign citizens with temporary visas. Seventy-seven percent of these were from developing countries, and 87 percent were enrolled at land-grant institutions.

The major source of support for 2,400 graduate students--30 percent of the total--came from their own institutions. Thus, institutional support predominated as the greatest source of graduate student support. The federal government--through fellowships or research grants--ranked second, providing support to 23 percent of the students.

Fourteen percent of the students were reported to derive their major support from personal funds, 12 percent from state governments, and 6 percent from industry.

Foreign governments provided the major support to 840 students, or 11 percent of the total. If one assumes all of these were foreign students, then foreign governments were the major source of support for 52 percent of all the foreign graduate students in plant biology.

Figure 6
Graduate Students in Plant Biology
AY 1982-83

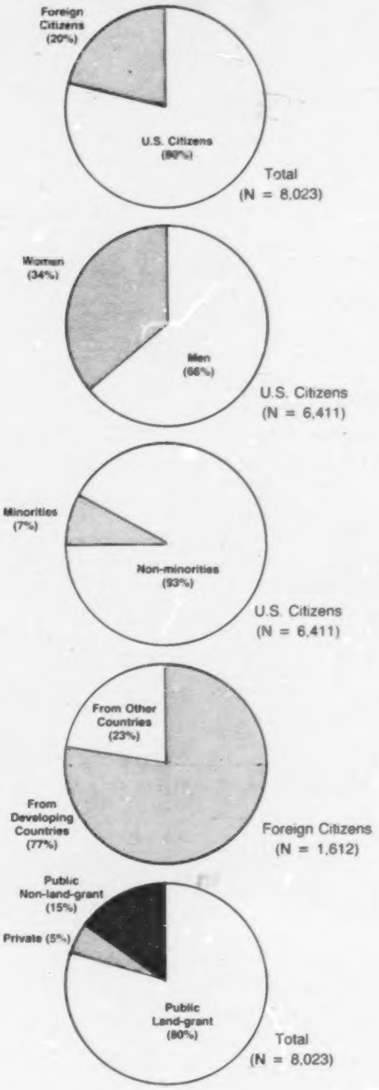
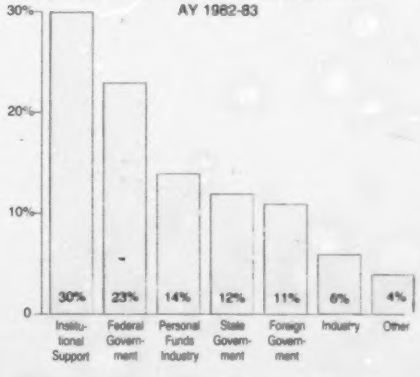


Figure 7
Sources of Major Support for Graduate Students
AY 1982-83



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[3] The Department of Education's Office of Civil Rights (OCR) reported that racial/ethnic minorities in 1980 comprised 9 percent of the U.S. graduate students in agriculture and natural resources and the biological sciences combined. Source: Rosa M. Simmons and Susan G. Broyles, Fall Enrollment in Colleges and Universities, 1980 (Washington: Government Printing Office, 1982).

An estimated 925 men and women received doctorates in plant biology in academic year 1982-83. A 14 percent increase (to 1,050) was estimated for academic year 1983-84.

Women received 21 percent of the plant biology degrees, and members of racial/ethnic minority groups were awarded 5 percent of the total (see figure 8).[4]

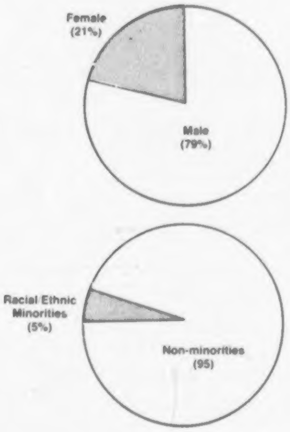

Figure 8
Doctorates Awarded in Plant Biology, Academic Year 1982-83
Total: 925

Areas of Concentration

Ecology was the discipline in which there was the greatest concentration in graduate student training and faculty research. Plant physiology and systematics showed the second and third highest degrees of concentration in these two areas of academic activity.

For postdoctoral research and training, however, the results were somewhat different. Plant physiology ranked first, with biochemistry and ecology holding the second and third places, respectively.

This ranking was determined by having the respondents list, in rank order, the 3 major disciplines that best characterized the areas of greatest concentration in their plant biology program(s).

A weighted score for each discipline was calculated by assigning it a value of 3 when it ranked highest, a value of 2 when it ranked second highest, and a value of 1 when it ranked third highest. The values were summed to get a total score for each discipline. The scores were summed and percentage distributions were calculated separately for (1) graduate student training, (2) postdoctoral research and training, and (3) faculty research (see table B).

TABLE B--Highest Ranking Areas of Concentration in Plant Biology, AY 1982-83

Area of Concentration	Rank	Percent of Total Weighted Score
Graduate Student Training		
Ecology	1	20%
Plant physiology	2	16
Systematics	3	11
Agronomy and soil science	4	8
Biochemistry	5	7
Faculty Research		
Ecology	1	19%
Plant physiology	2	18
Systematics	3	10
Biochemistry	4	7
Agronomy and soil science	5	6
Postdoctoral Training and Research		
Plant physiology	1	21%
Biochemistry	2	14
Ecology	3	11
Plant pathology	4	8
Molecular biology	5	7

Note: Graduate study and research are conducted in disciplines with low (or even no) scores. The low score indicates that few institutions have made the discipline a top priority.

Reference: Table 6

Each institution was also asked to indicate, for the discipline it ranked highest for graduate student training, those fields in which students were required to take courses, or to have taken courses as undergraduates. Detailed tables series 7 presents the results in the form of cross tabulations showing the number of institutions that ranked each plant biology discipline highest for graduate student study and the number of institutions that required courses in selected fields. Table C presents those data as percentages for the 5 top-ranked disciplines.

Of the 40 institutions that reported ecology as the top-ranked discipline for graduate student training, 49 percent required courses in biochemistry; 80 percent required coursework in genetics; 73 percent required courses in plant physiology; and nearly all required courses in ecology/evolution. Of the 17 institutions that reported the greatest concentration as being in plant physiology, all required their graduate students to have coursework in biochemistry; 88 percent required courses in genetics; and 82 percent required courses in plant physiology.

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[4] The Department of Education's Office of Civil Rights (OCR) reported that racial/ethnic minorities in 1981 earned 6.5 percent of the doctorates awarded in agriculture and natural resources and the biological sciences combined. Source: W. Vance Grant and Thomas D. Snyder, Digest of Education Statistics, 1983-84, (Washington: Government Printing Office, 1983).

TABLE C--Required Courses, by Selected Graduate Study Discipline, AY 1982-83

Highest-Ranked Discipline for Graduate Study	Number of Institutions	Percentage of Institutions in Column A That Required Courses In				
		Biochemistry	Genetics	Plant Structure	Ecology/Evolution	Plant Physiology
	A	B	C	D	E	F
Ecology	40	49%	80%	61%	95%[a]	73%
Plant physiology	17	100	88	59	53	82[a]
Systematics	15	53	80	87	80	60
Agronomy/soil science	14	93	93	64	14	100
Developmental biology	10	100	100	80	60	60

[a] The expectation was that all institutions reporting ecology/evolution and plant physiology as the highest-ranked disciplines for graduate student training would require courses in those areas. However, the percentages are less than 100 because several smaller institutions indicated that they had no specific course requirements; study in each field is conducted through advanced seminars or through individually directed work.

Reference: Table 7

Personnel Supply and Demand

Shortage Disciplines. Molecular biology was the discipline most frequently identified by the surveyed institutions as having a shortage of personnel in academia, industry, and government.[5] Biochemistry and genetics were the second most frequently cited shortage areas, depending on the type of employment being considered (see table D).

At land-grant institutions, molecular biology was also the discipline most frequently identified as a shortage area. However, as shown in table D, the second-ranked shortage disciplines at these institutions differed among types of employment.

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[5] Respondents were asked to assess the employment market for plant biologists in 5 categories: (1) postdoctoral training positions, (2) permanent doctoral research associate positions, (3) tenure-track faculty, (4) industrial positions, and (5) federal or state government positions. Respondents identified the disciplines with a shortage and with a surplus of personnel or indicated if there was a supply/demand balance across all fields in a given employment category.

TABLE D--Disciplines Frequently Cited as Having a Shortage of Personnel, by Employment Category, 1982-83

Employment Category	Type of Institution	Most Frequently Cited	Second Most Frequently Cited
Postdoctoral training positions	All	Molecular biology	Biochemistry
	Land-grant	Molecular biology	Biochemistry
Permanent doctoral research associate positions	All	Molecular biology	Biochemistry
	Land-grant	Molecular biology	Biochemistry; Genetics; Horticulture/crop science
Tenure-track faculty positions	All	Molecular biology	Genetics
	Land-grant	Molecular biology	Horticulture/crop science
Industrial positions	All	Molecular biology	Biochemistry; Genetics
	Land-grant	Molecular biology	Genetics; Plant pathology
Federal/state government positions	All	Molecular biology	Biochemistry
	Land-grant	Molecular biology	Agronomy/soil science

Reference: Table 9A

TABLE E--Disciplines Frequently Cited as Having a Surplus of Personnel, by Employment Category, 1982-83

Employment Category	Type of Institution	Most Frequently Cited	Second Most Frequently Cited
Postdoctoral training positions	All	Ecology	Systematics
	Land-grant	Ecology	Systematics
Permanent doctoral research associate positions	All	Ecology	Anatomy/morphology
	Land-grant	Ecology	Plant pathology
Tenure-track faculty positions	All	Ecology	Systematics
	Land-grant	Ecology	Systematics
Industrial positions	All	Ecology	Systematics
	Land-grant	Ecology	Systematics; Evolution Anatomy/morphology
Federal/state government positions	All	Ecology	Systematics
	Land-grant	Ecology	Evolution; Anatomy/morphology

Reference: Table 9B

Surplus Disciplines. Ecology was most frequently cited as the discipline in which there was a surplus of personnel for all employment categories. Systematics was the second most frequently cited surplus discipline in each category except for postdoctorate research positions, where it was replaced by anatomy/morphology.

At land-grant institutions, ecology was most frequently cited as a surplus field regardless of the employment category. The second most frequently cited fields were, variously, systematics, evolution, plant pathology, and anatomy/morphology.

Organization

More than half (54 percent) of the institutions reported that plant biology graduate work is concentrated in colleges of arts and sciences. Nearly one-third indicated that it was centered in colleges of agriculture, forestry, or natural resources, and one-sixth said it was focused in special colleges, institutes, or divisions such as schools of applied biology, colleges of pure and applied sciences, and divisions of biology and medicine.

However, these figures are misleading in terms of where the bulk of the activity in the field takes place. The institutions with the largest faculties and enrollments are the land-grant institutions. Nearly seven-eighths reported their plant biology efforts concentrated in colleges of agriculture, forestry, or natural resources. The land-grant colleges and universities, though representing less than one-third of the doctoral institutions engaged in graduate work in plant biology, had four-fifths of the faculty and students, awarded four-fifths of the doctorates, and received four-fifths of research support dollars in the field.

Contrasts between Land-grant and Private Institutions

In the foregoing discussion, few comparisons have been made between land-grant and private institutions because the preponderant share of plant biology activity is centered in the former. As noted above, they accounted for 80 percent of the faculty, doctorates, and graduate students in the field. The public non-land-grant institutions accounted for about 15 percent of the totals in these areas and the private institutions had the remaining 5 percent. Some variations from these patterns appear, however. Private institutions, for example, had 14 percent of all the postdoctoral fellows/associates.

A large part (70 percent) of the research support reported by private institutions came from the federal government. This contrasts with the 44 percent of federal support at land-grant institutions. Private institutions got practically no research funds from the state governments, whereas land-grant institutions received 40 percent of their support from that source. Industry and other sources together provided the private sector with about 30 percent of its research support. This was about double the percentage that those sources furnished the land-grant institutions. Note, however, that in terms of dollars, the funds received by the land-grant institutions far exceeded those received by the private colleges and universities. Land-grant colleges and universities received 8 of every 10 support dollars.

Sources of major support for graduate students also varied between the land-grant and private institutional sectors. More than half of the

Figure 9

Private Institutions' Share of Plant Biology Support and Personnel

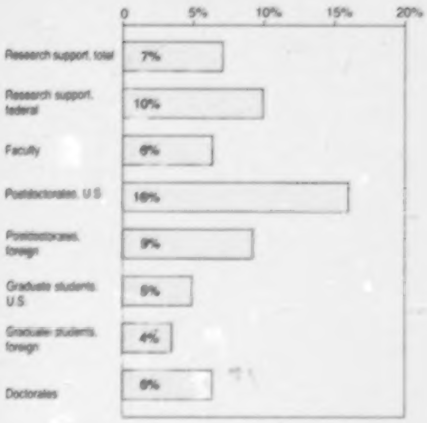
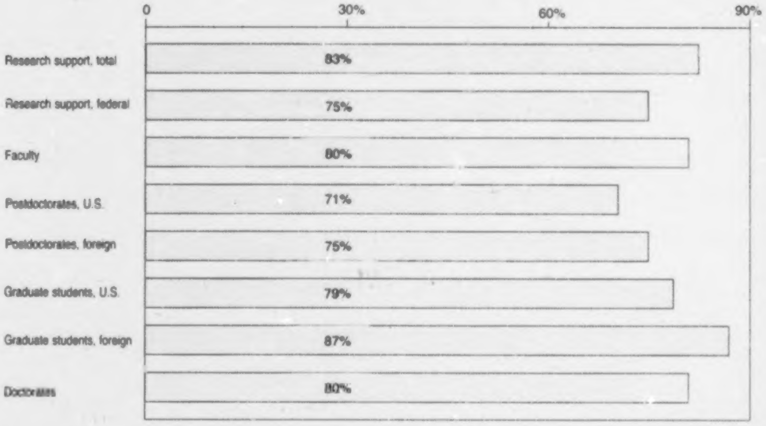


Figure 10

Land-grant Institutions' Share of Plant Biology Support and Personnel



graduate students at private institutions were reported to receive their major support from their college or university and one-third from federal government sources. At land-grant institutions, just over one-quarter received major support from their institutions; just under one-quarter received major support from the federal government.

Private institutions reported a higher proportion of minority group members among U.S. graduate students than did land-grant institutions (16 percent versus 7 percent). They also showed higher proportions of minorities on their faculties (8 percent versus 4 percent). Land-grant institutions, however, counted 42 minorities (6 percent) among their 1982-83 doctoral awards, whereas private institutions reported only one (less than 1 percent). Both types of institution reported about the same proportion (8 percent) of minorities among their U.S. postdoctorates.

The distribution of faculty among departments varied between private and land-grant institutions. At the former, over half (54 percent) of the plant biology faculty were in departments of biology. At land-grant institutions they were found in a wider range of departments, four of which--agriculture and soil science, horticulture, plant pathology, and botany--accounted for over half (56 percent) of the total.

About one-quarter of the private institutions reported faculty vacancies; this contrasts with four-fifths (81 percent) of the land-grant universities. However, because of the difference in total faculty size, the vacancies represented about one-tenth of the plant biology faculty at private institutions, but less than one-twentieth at the land-grant universities.

20 Largest Institutions

Separate tallies were made on several questionnaire items for the top 20 responding institutions that received the greatest federal life sciences research and development (R&D) support in 1982.[6] Figure 10 shows several of the survey measures (research support, faculty, postdoctorates, etc.) and the percentages accounted for by these 20 institutions. Whereas these institutions accounted for 20 percent of the federally funded research support in plant biology, they received 33 percent of federally funded R&D in the life sciences in FY 1982.

At the top 20 institutions there were 61 faculty vacancies, which represented nearly 8 percent of the plant biology faculty at these universities. That proportion was about twice the 4 percent figure registered by the remaining 145 institutions.

The principal areas of concentration for postdoctoral research and training at the top 20 institutions varied somewhat from the other colleges and universities. Molecular biology was ranked second at the 20 largest institutions; sixth at the remainder. Systematics was ranked tenth by the 20 large institutions and fifth by the remaining institutions. Table F compares the high-ranking disciplines at the two groups of institutions for each of the three areas of training and research. Detailed table series 6 gives a more complete picture of the rankings.

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[6] These 20 institutions include only 13 of the first 20 on a list prepared by the National Science Foundation (NSF) that rank-ordered institutions by the amount of federal R&D funding in the life sciences for fiscal year 1982. Seven of NSF's first 20 institutions were not included because 2 are medical schools; 2 indicated that they did not have graduate programs in plant biology; 3 did not respond to the questionnaire. To get a total of 20 respondents for this "20 largest" category, it was necessary to go down the NSF ranked list to the 33rd institution.

Shown in Appendix C are the first 50 institutions on the NSF rank-ordered list.

Figure 11
20 Largest Institutions' Share of Plant Biology Support and Personnel

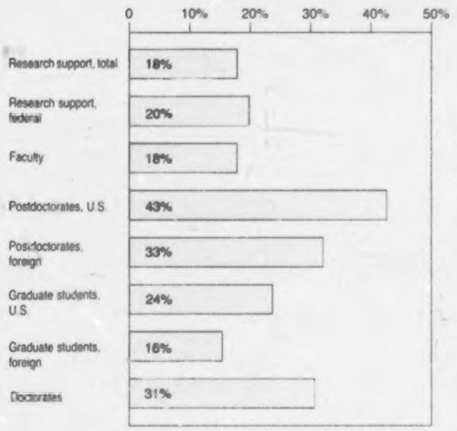

TABLE F--Comparison of Highest Ranking Areas of Concentration at the 20 Largest Institutions with All Other Institutions, AY 1982-83

20 Largest Institutions		All Other Institutions	
Rank	Discipline	Rank	Discipline
	Postdoctoral Training and Research		
1	Plant physiology	1	Plant physiology
2	Molecular biology	2	Biochemistry
3	Ecology	3	Ecology
4	Biochemistry	4	Plant pathology
5	Plant pathology	5	Systematics
	Faculty Research		
1	Ecology	1	Ecology
1	Plant physiology	2	Plant physiology
3	Molecular biology	3	Systematics
4	Biochemistry	4	Biochemistry
4	Systematics	5	Agronomy/soil science
	Graduate Student Training		
1	Ecology	1	Ecology
2	Plant physiology	2	Plant physiology
3	Molecular biology	3	Systematics
3	Biochemistry	4	Agronomy/soil science
5	Plant pathology	5	Biochemistry
5	Systematics		

Reference: Table 6

Plant Biology's Representation in the Life Sciences

As noted previously, the $98 million of federal funds for research support in plant biology was equal to 4 percent of the total federal research and development (R&D) expenditures in the life sciences for fiscal year 1982. This contrasts with the 12 percent share that plant biology graduate students represented of all graduate students in the life sciences in 1982.[7]

Faculty and postdoctorates in plant biology represented 6 percent of the 101,000 academic scientists in the life sciences at doctorate-granting institutions as reported by the National Science Foundation.[8]

The 1,000 postdoctorates in plant biology reported in this study represented 8 percent of all the postdoctorates in the life sciences at doctorate-granting institutions.[9] It should be noted that postdoctoral training in many of the life sciences, particularly the biomedical disciplines, is now considered a necessary transition between graduate training and a faculty--or faculty equivalent--position. However, that is not true in general for the agricultural sciences.

Women represented 29 percent of all the postdoctorates in plant biology; foreign citizens accounted for 33 percent. Comparable figures for all of the life sciences in 1982 were 26 percent and 30 percent, respectively.[10]

The 925 plant biology doctorates identified by this survey represented 17 percent of the life sciences doctorates reported by the National Research Council (NRC) in its annual doctorate survey.[11] Women were awarded 21 percent of the doctorates in plant biology; this compares with their 31 percent share of all doctorates in the biological sciences.

U.S. citizens who were members of racial/ethnic minorities earned 5 percent of the plant biology Ph.D.'s awarded in 1982-83. In contrast, minorities were awarded 9 percent of all the doctorates in the biological sciences and 8 percent in the agricultural sciences.

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[7] National Science Foundation (NSF), Academic Science/Engineering: Graduate Enrollment and Support, Fall 1982, (Washington, NSF, 1984).

[8] National Science Foundation (NSF), Academic Science and Engineering: Scientists and Engineers, January 1983 (Washington: NSF, 1984).

[9] NSF, Academic Science/Engineering, 1982.

[10] NSF, Academic Science/Engineering, 1982.

[11] NRC, Summary Report 1983, Doctorate Recipients from United States Universities, (Washington: National Academy Press, 1983).

Foreign students represented 20 percent of all the plant biology graduate students in doctorate-granting institutions. The 840 students who received their major support from foreign governments is equal to 52 percent of this enrollment from abroad. These figures--especially the latter--contrast with the 1982 data for all of the life sciences. Foreign students represented only 14 percent of that total, and foreign support in 1982-83 aided only 29 percent of the foreign full-time graduate students.[12]

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[12] NSF, Academic Science/Engineering, 1982.

METHODS SUMMARY

The foregoing findings are based on data obtained by the Higher Education Panel which forms the basis of a continuing survey research program created in 1971 by the American Council on Education. The Panel's purpose is to conduct surveys on topics of current policy interest to the higher education community and to government agencies.

The Panel is a disproportionate stratified sample of 760 colleges and universities drawn from the population of more than 3,000 institutions listed in the National Center for Education Statistics' Education Directory, Colleges and Universities. All institutions in the population are grouped according to the Panel's stratification design, which is based upon institution type (university, four-year college), control (public, private), and size (full-time-equivalent enrollment). For any given survey, either the entire Panel or an appropriate subgroup is used.

The survey is dependent upon a network of campus representatives at the Panel institutions whose presidents have agreed to participate. The representatives receive the Panel questionnaires and direct them to the most appropriate campus officials for response.

This survey involved a limited number of institutions, those that granted at least five doctorates in the the arts and sciences and engineering combined in 1980--an estimated 209 institutions. Excluded were doctorate-granting institutions that were primarily professional schools of medicine, theology, education, law, and the fine arts.

Questionnaires were sent to the selected institutions in October 1983. The survey was complicated, requiring coordination among numerous departments and, at many universities, between schools of agriculture and colleges of arts and sciences. Thus, "plant biology coordinators," who in most cases were plant biologists, were designated at many of the larger institutions to take the lead in identifying the relevant departments and data sources and in overseeing the completion of the questionnaire. Their assistance was invaluable.

A follow-up mailing was sent to nonrespondents in late November, and follow-up telephone calls were made during December 1983 and January 1984. Data gathering was cut off on January 31, 1984.

Data obtained from the questionnaires, telephone calls, and in some cases, institutions' catalogues, indicated that graduate programs in plant biology were conducted at 165 of the doctorate-granting institutions. Nearly seven-eighths of these institutions provided substantive data which were statistically adjusted by computing institutional weights based upon the ratio of respondents to the number of institutions in the population, separately for each institutional stratum.

Appendix B presents the stratification design used to produce the national estimates and a comparision of respondents and nonrespondents, according to various institutional characteristics.

DETAILED STATISTICAL TABLES

TABLE 1

Number of Institutions with Graduate Training Programs in Plant Biology, by School/Division with Primary Responsibility for Training, AY 1982-83

Administrative Unit in Which Training Is Primarily Focused	All Institutions	Public		Private
		All	Land-grant	
All Institutions				
All administrative units	165	118	48	47
College/division of arts and sciences	89	56	5	33
College/school/division of agricultural/forestry/natural resources	49	43	41	5
Other administrative unit	27	19	2	9
20 Largest Institutions[a]				
All administrative units	20	11	7	9
College/division of arts and sciences	13	6	2	7
College/school/division of agricultural/forestry/natural resources	5	4	4	1
Other administrative unit	2	1	1	1
Institutions Other Than the 20 Largest				
All administrative units	145	107	41	38
College/division of arts and sciences	76	50	3	26
College/school/division of agricultural/forestry/natural resources	44	39	37	4
Other administrative unit	25	18	1	8

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[a] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

TABLE 2A

Number of Plant Biologists and the Percentage Training Graduate Students, by Department and by Control of Institution, AY 1982-83

All Institutions

Department[a]	All Institutions		All Public Institutions		Land-grant Institutions[b]		Private Institutions	
	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total
All departments	4,759	81%	4,491	81%	3,802	79%	268	81%
Botany/plant science	913	83	874	83	717	81	39	87
(Botany)	(600)	(90)	(561)	(90)	(404)	(88)	(39)	(87)
(Plant science)	(313)	(72)	(313)	(72)	(313)	(72)	(-)	(nap)
Agronomy and soil science	806	73	806	73	795	74	-	nap
Biology/biological sciences	633	83	466	85	128	81	167	80
(Biology)	(428)	(82)	(284)	(84)	(74)	(80)	(144)	(76)
(Biological sciences)	(205)	(87)	(182)	(86)	(54)	(83)	(23)	(100)
Horticulture	506	73	506	73	506	73	-	nap
Plant pathology	434	82	434	82	434	82	-	nap
Forestry	246	79	230	77	206	79	16	100
Plant and soil science	195	71	195	71	181	69	-	nap
Biochemistry	109	93	106	94	100	94	3	33
Genetics	56	89	55	91	55	91	1	0
Chemistry	18	100	17	100	2	100	1	100
Marine sciences/oceanography	13	100	13	100	1	100	-	nap
All others	830	87	789	87	677	87	41	78

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[a] Department names cited by 5 or more institutions.

[b] Land-grant institutions are a subset of "all public" institutions.

- Represents zero

nap Not applicable

Note: Total faculty counts shown in this table differ by 3 percent from those in the series 3 tables. This table shows counts of plant biology faculty in departments that were involved in training plant biology graduate students. The series 3 tables show counts of faculty in plant biology programs. See appendix A for a facsimile of the survey questionnaire.

TABLE 2B

Number of Plant Biologists and the Percentage Training Graduate Students, by Department and by Control of Institution, AY 1982-83

20 Largest Institutions[a]

Department[b]	All Institutions		All Public Institutions		Land-grant Institutions[b]		Private Institutions	
	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total
All departments	863	85%	762	85%	676	83%	101	87%
Botany/plant science	118	98	101	98	72	97	17	100
(Botany)	(96)	(100)	(79)	(100)	(50)	(100)	(17)	(100)
(Plant science)	(22)	(91)	(22)	(91)	(22)	(91)	(-)	(nap)
Agronomy and soil science	52	77	52	77	52	77	-	nap
Biology/biological sciences	87	90	40	93	26	92	47	87
(Biology)	(64)	(86)	(30)	(90)	(16)	(88)	(34)	(82)
(Biological sciences)	(23)	(100)	(10)	(100)	(10)	(100)	(13)	(100)
Horticulture	99	76	99	76	99	76	-	nap
Plant pathology	80	93	80	93	80	93	-	nap
Forestry	80	79	66	74	66	74	14	100
Plant and soil science	42	45	42	45	42	45	-	nap
Biochemistry	33	100	32	100	28	100	1	100
Genetics	25	96	25	96	25	96	-	nap
Chemistry	6	100	6	100	1	100	-	nap
Marine sciences/oceanography	3	100	3	100	-	nap	-	nap
All others	238	85	216	87	185	85	22	68

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[a] The 20 responding institutions with the largest federally finance R&D expenditures oin the life sciences in 1982.

[b] Department names cited by 5 or more institutions.

[c] Land-grant institutions are a subset of "all public" institutions.

- Represents zero

nap Not applicable

Note: The total faculty count shown in this table differs by 10 percent from that shown in the series 3 tables. This table shows counts of plant biology faculty in departments that were involved in training plant biology graduate students. The series 3 tables show counts of faculty in plant biology programs. See appendix A for a facsimile of the survey questionnaire.

TABLE 2C

Number of Plant Biologists and the Percentage Training Graduate Students, by Department and by Control of Institution, AY 1982-83

Institutions Other than the 20 Largest

Department[a]	All Institutions		All Public Institutions		Land-grant Institutions[b]		Private Institutions	
	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total	Total	Faculty Training Graduate Students as a Percentage of Total
All departments	3,896	80%	3,729	80%	3,126	79%	167	77%
Botany/plant science	795	81	773	81	645	79	22	77
(Botany)	(504)	(88)	(482)	(88)	(354)	(86)	(22)	(77)
(Plant science)	(291)	(70)	(291)	(70)	(291)	(70)	(-)	(nap)
Agronomy and soil science	754	73	754	73	743	73	-	nap
Biology/biological sciences	546	82	426	84	102	78	120	77
(Biology)	(364)	(81)	(254)	(84)	(58)	(78)	(110)	(75)
(Biological sciences)	(182)	(86)	(172)	(85)	(44)	(80)	(10)	(100)
Horticulture	407	72	407	72	407	72	-	nap
Plant pathology	354	80	354	80	354	80	-	nap
Forestry	166	79	164	79	140	81	2	100
Plant and soil science	153	78	153	78	139	76	-	nap
Biochemistry	76	89	74	92	72	92	2	0
Genetics	31	84	30	87	30	87	1	0
Chemistry	12	100	11	100	1	100	1	100
Marine sciences/oceanography	10	100	10	100	1	100	-	nap
All others	592	87	573	87	492	87	19	89

[a] Department names cited by 5 or more institutions.

[b] Land-grant institutions are a subset of "all public" institutions.

- Represents zero

nap Not applicable

Note: The total faculty counts shown in this table differs by 2 percent from that shown in the series 3 tables. This table shows counts of plant biology faculty in departments that were involved in training plant biology graduate students. The series 3 tables show counts of faculty in plant biology programs. See appendix A for a facsimile of the survey questionnaire.

TABLE 3

Students and Faculty in Graduate Plant Biology Programs, by Type of Institution and by Sex, AY 1982-83, with Total Estimates for AY 1983-84

	1982-83			1983-84
Type of Student/Faculty	Men	Women	Total	Estimated Total
All Institutions				
Full-time graduate students	5,539	2,484	8,023	8,040
Ph.D. recipients	730	195	925	1,050
Postdoctoral fellows/associates	715	294	1,009	1,020
Full-time faculty	4,288	319	4,607	4,660
Public Institutions				
Full-time graduate students	5,287	2,361	7,648	7,670
Ph.D. recipients	691	177	868	970
Postdoctoral fellows/associates	630	241	871	860
Full-time faculty	4,067	277	4,344	4,400
Land-grant Institutions				
Full-time graduate students	4,568	1,874	6,442	6,500
Ph.D. recipients	600	140	740	810
Postdoctoral fellows/associates	523	208	731	730
Full-time faculty	3,467	207	3,674	3,720
Private Institutions				
Full-time graduate students	252	123	375	370
Ph.D. recipients	39	18	57	80
Postdoctoral fellows/associates	85	53	138	160
Full-time faculty	221	42	263	260
20 Largest Institutions[a]				
Full-time graduate students	1,206	562	1,768	1,750
Ph.D. recipients	226	65	291	290
Postdoctoral fellows/associates	281	117	398	400
Full-time faculty	730	54	784	800
Institutions Other Than the 20 Largest				
Full-time graduate students	4,333	1,922	6,255	6,290
Ph.D. recipients	504	130	634	760
Postdoctoral fellows/associates	434	177	611	620
Full-time faculty	3,558	265	3,823	3,860

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[a] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

TABLE 4

Number of Racial/Ethnic Minority[a] Students and Faculty in Graduate Plant Biology Programs, by Type of Institution, AY 1982-83

Type of Student/Faculty	All Institutions	Public		Private
		All	Land-grant	
All Institutions				
Full-time students	459	411	359	48
1982-93 Ph.D. recipients	46	45	42	1
Postdoctoral fellows/ associates	72	63	41	9
Full-time faculty	207	185	150	22
20 Largest Institutions[b]				
Full-time students	74	65	62	9
1982-93 Ph.D. recipients	9	9	9	0
Postdoctoral fellows/ associates	17	11	10	6
Full-time faculty	18	17	15	1
Institutions Other Than the 20 Largest				
Full-time students	385	346	297	39
1982-93 Ph.D. recipients	37	36	33	1
Postdoctoral fellows/ associates	55	52	31	3
Full-time faculty	189	168	135	21

[a] Racial/ethnic groups included were: American Indian/Alaskan Native; Black, non-Hispanic; Asian or Pacific Islander; Hispanic. Racial/ethnic group data pertain to U.S. citizens and non-U.S. citizens with permanent visas only.

[b] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

TABLE 5

Number of Graduate Students and Postdoctorates in Plant Biology Programs, by Sex and Citizenship Status, AY 1982-83

Type of Individual	Total	Men	Women	From Developing Countries
All Institutions				
Total				
Full-time graduate students	8,023	5,539	2,484	na
Postdoctoral fellows/associates	1,009	715	294	na
Foreign citizens[a]				
Full-time graduate students	1,612	1,284	328	1,248
Postdoctoral fellows/associates	331	266	65	130
U.S. citizens[b]				
Full-time graduate students	6,411	4,255	2,156	na
Postdoctoral fellows/associates	678	449	229	na
Public Institutions				
Total				
Full-time graduate students	7,648	5,287	2,361	na
Postdoctoral fellows/associates	871	630	241	na
Foreign citizens[a]				
Full-time graduate students	1,543	1,235	308	1,200
Postdoctoral fellows/associates	301	242	59	119
U.S. citizens[b]				
Full-time graduate students	6,105	4,052	2,053	na
Postdoctoral fellows/associates	570	388	182	na
Land-grant Institutions				
Total				
Full-time graduate students	6,442	4,568	1,874	na
Postdoctoral fellows/associates	731	523	208	na
Foreign citizens[a]				
Full-time graduate students	1,405	1,149	256	1,098
Postdoctoral fellows/associates	247	197	50	85
U.S. citizens[b]				
Full-time graduate students	5,037	3,419	1,618	na
Postdoctoral fellows/associates	484	326	158	na

TABLE 5--Continued

Number of Graduate Students and Postdoctorates in Plant Biology Programs, by Sex and Citizenship Status, AY 1982-83

Type of Individual	Total	Men	Women	From Developing Countries
Private Institutions				
Total				
Full-time graduate students	375	252	123	na
Postdoctoral fellows/associates	138	85	53	na
Foreign citizens[a]				
Full-time graduate students	69	49	20	48
Postdoctoral fellows/associates	30	24	6	11
U.S. citizens[b]				
Full-time graduate students	306	203	103	na
Postdoctoral fellows/associates	108	61	47	na
20 Largest Institutions[c]				
Total				
Full-time graduate students	1,768	1,206	562	na
Postdoctoral fellows/associates	398	281	117	na
Foreign citizens[a]				
Full-time graduate students	250	197	53	140
Postdoctoral fellows/associates	108	89	19	33
U.S. citizens[b]				
Full-time graduate students	1,518	1,009	509	na
Postdoctoral fellows/associates	290	192	98	na
Institutions Other than the 20 Largest				
Total				
Full-time graduate students	6,255	4,333	1,922	na
Postdoctoral fellows/associates	611	434	177	na
Foreign citizens[a]				
Full-time graduate students	1,362	1,087	275	1,108
Postdoctoral fellows/associates	223	177	46	97
U.S. citizens[b]				
Full-time graduate students	4,893	3,246	1,647	na
Postdoctoral fellows/associates	388	257	131	na

[a] Individuals who are non-U.S. citizens on temporary visas.

[b] Includes non-U.S. citizens who have permanent visas.

[c] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

na Not available. Developing countries data were requested for foreign (temporary visa) individuals only.

TABLE 6

Principal Areas of Concentration in Training and Research in Plant Biology, by Discipline, AY 1982-83

Discipline	Graduate Student Training	Postdoctoral Research & Training	Faculty Research
All Institutions (N = 165)			
Total	100.0%	100.0%	100.0%
Agronomy/soil science	7.6	3.8	5.7
Anatomy/morphology	2.1	3.6	3.6
Biochemistry	7.1	14.1	7.2
Cell biology	4.1	5.0	5.2
Developmental biology	5.6	5.0	5.6
Ecology	19.5	10.9	18.5
Evolution	2.5	1.6	3.0
Forestry/natural resources	3.5	2.6	3.1
Genetics	5.1	3.2	3.7
Horticulture crop science	3.0	2.4	3.7
Molecular biology	4.2	7.2	4.2
Plant pathology	4.8	7.9	5.0
Plant physiology	15.6	21.0	17.9
Systematics	10.5	5.7	10.0
Weed science	0.4	1.7	0.5
Other	4.4	4.3	3.1
20 Largest Institutions[a] (N=20)			
Total	100.0%	100.0%	100.0%
Agronomy/soil science	1.7	2.5	0
Anatomy/morphology	0	0.8	2.5
Biochemistry	11.7	10.0	9.2
Cell biology	2.5	8.3	2.5
Developmental biology	5.8	5.0	5.0
Ecology	20.7	11.7	16.6
Evolution	5.0	0.8	6.7
Forestry/natural resources	2.5	5.8	2.5
Genetics	2.5	7.5	4.2
Horticulture crop science	5.0	0.8	7.5
Molecular biology	11.7	16.7	13.3
Plant pathology	6.7	9.2	4.2
Plant physiology	15.0	17.6	16.6
Systematics	6.7	3.3	9.2
Weed science	0	0	0
Other	2.5	0	0

TABLE 6--Continued

Principal Areas of Concentration in Training and Research in Plant Biology, by Discipline, AY 1982-83

Discipline	Graduate Student Training	Postdoctoral Research & Training	Faculty Research
Institutions Other than 20 Largest (N=145)			
Total	100.0%	100.0%	100.0%
Agronomy/soil science	8.4	4.0	6.5
Anatomy/morphology	2.4	4.0	3.7
Biochemistry	6.5	14.6	7.0
Cell biology	4.3	4.5	5.6
Developmental biology	5.6	5.0	5.7
Ecology	19.4	10.8	18.6
Evolution	2.1	1.8	2.4
Forestry/natural resources	3.6	2.1	3.2
Genetics	5.4	2.6	3.6
Horticulture crop science	2.7	2.6	3.2
Molecular biology	3.1	5.9	2.9
Plant pathology	4.5	7.7	5.2
Plant physiology	15.8	21.4	18.0
Systematics	11.0	6.1	10.2
Weed science	0.5	2.0	0.6
Other	4.7	4.9	3.6

[a] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

Note: Percentage distribution of weighted scores. Respondents indicated the first-, second-, and third-ranking disciplines for each type of training/research. These rankings were converted to scores which in turn were converted to the percentages shown here.

TABLE 7

Required Courses by Highest-Ranked Discipline

Discipline Ranked Highest for Graduate Training	Number of Institutions That Ranked Discipline Highest	Number of Institutions That Required Courses in:				
		Biochemistry	Genetics	Plant Structure	Ecology/ Evolution	Plant Physiology
All Institutions (N = 165)						
Total	165	119	138	95	103	115
Agronomy/soil science	14	13	13	9	2	14
Anatomy/morphology	2	2	2	1	2	1
Biochemistry	8	8	6	2	3	4
Cell biology	8	8	7	2	3	4
Developmental biology	10	10	10	8	6	6
Ecology	41	20	33	25	39	30
Evolution	3	1	3	1	3	1
Forestry/natural resources	4	2	1	4	4	4
Genetics	7	3	7	2	3	5
Horticulture/crop science	5	5	5	4	1	4
Molecular biology	7	7	7	1	3	5
Plant pathology	9	7	8	9	6	8
Plant physiology	17	17	15	10	9	14
Systematics	15	8	12	13	12	9
Other	9	8	9	4	7	8
No response	6	nap	nap	nap	nap	nap
Public Institutions (N=118)						
Total	118	85	103	74	76	90
Agronomy/soil science	14	13	13	9	2	14
Anatomy/morphology	2	2	2	1	2	1
Biochemistry	4	4	4	1	2	2
Cell biology	5	5	5	2	2	4
Developmental biology	5	5	5	5	5	4
Ecology	28	13	23	17	27	20
Evolution	2	-	2	1	2	1
Forestry/natural resources	4	2	1	4	4	4
Genetics	5	2	5	1	2	4
Horticulture/crop science	5	5	5	4	1	4
Molecular biology	2	2	2	-	1	2
Plant pathology	9	7	8	9	6	8
Plant physiology	12	12	11	8	6	10
Systematics	9	6	9	8	8	7
Other	8	7	8	4	6	7
No response	4	nap	nap	nap	nap	nap
Private Institutions (N=47)						
Total	47	34	35	21	27	25
Agronomy/soil science	-	-	-	-	-	-
Anatomy/morphology	-	-	-	-	-	-
Biochemistry	4	4	2	1	1	2
Cell biology	3	3	2	-	1	-
Developmental biology	5	5	5	3	1	2
Ecology	13	7	10	8	12	10
Evolution	1	1	1	-	1	-
Forestry/natural resources	-	-	-	-	-	-
Genetics	2	1	2	1	1	1
Horticulture/crop science	-	-	-	-	-	-
Molecular biology	5	5	5	1	2	3
Plant pathology	-	-	-	-	-	-
Plant physiology	5	5	4	2	3	4
Systematics	6	2	3	5	4	2
Other	1	1	1	-	1	1
No response	2	nap	nap	nap	nap	nap

- Means zero.

nap: Not applicable

TABLE 8A

Number of Institutions with Faculty Vacancies in Plant Biology and Number of Vacancies

Item	All Institutions	Public All	Public Land-grant	Private	20 Largest[a] Institutions	Institutions Other than 20 Largest
Number of institutions with vacancy	67	54	39	13	15	52
Number of vacancies	213	190	168	23	61	152

[a] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

TABLE 8B

Number of Institutions with Faculty Vacancies, by Discipline with Greatest Need for Faculty

Discipline	All Institutions	Public All	Public Land-grant	Private	20 Largest Institutions[a]	Institutions Other than 20 Largest
All disciplines	67	54	39	13	15	52
Molecular biology	18	12	7	6	4	14
Horticulture/crop science	8	8	8	-	-	7
Agronomy/soil science	7	7	6	-	-	7
All others	34	27	18	7	10	24

[a] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

Note: This table shows the estimated number of institutions with one or more faculty vacancies as of fall 1983 in plant biology programs. The three disciplines listed are those most frequently identified as having the greatest need for faculty.

TABLE 8C

Most Important Reason for Need to Recruit Plant Biology Faculty, by Discipline: Institutional Counts

Discipline	All Reasons	Research Opportunities	Faculty Retirements/ Departures	Increased Graduate Enrollments	Other	No Reason Given
Total	67	33	24	3	5	2
Agronomy/soil science	7	1	6	-	-	-
Anatomy/morphology	4	-	3	1	-	-
Biochemistry	4	4	-	-	-	-
Cell biology	1	1	-	-	-	-
Developmental biology	4	2	-	-	2	-
Ecology	2	-	1	-	1	-
Evolution	-	-	-	-	-	-
Forestry/natural resources	3	2	-	-	1	-
Genetics	1	-	1	-	-	-
Horticulture/crop science	8	4	4	-	-	-
Molecular biology	18	12	4	1	1	-
Plant pathology	4	3	1	-	-	-
Plant physiology	5	2	3	-	-	-
Systematics	1	-	1	-	-	-
Weed science	-	-	-	-	-	-
Other	3	2	-	1	-	-
No discipline identified	2	-	-	-	-	2

TABLE 9A

Disciplines Most Frequently Cited as Having a Shortage of Personnel, by Employment Category and Type of Institution

Employment Category	Most Frequently Cited Discipline	Second Most Frequently Cited Discipline
All Institutions		
Postdoctoral training positions	Molecular biology	Biochemistry
Permanent doctoral research associate positions	Molecular biology	Biochemistry
Tenure-track faculty positions	Molecular biology	Genetics
Industrial positions	Molecular biology	Biochemistry Genetics
Federal/state government positions	Molecular biology	Biochemistry
Public Institutions		
Postdoctoral training positions	Molecular biology	Biochemistry Plant physiology
Permanent doctoral research associate positions	Molecular biology	Biochemistry Plant physiology
Tenure-track faculty positions	Molecular biology	Genetics
Industrial positions	Molecular biology	Genetics
Federal/state government positions	Molecular biology	Agronomy/soil science
Private Institutions		
Postdoctoral training positions	Molecular biology	Biochemistry
Permanent doctoral research associate postitions	Molecular biology	Biochemistry
Tenure-track faculty positions	Molecular biology	Biochemistry
Industrial positions	Molecular biology	Biochemistry
Federal/state government positions	Molecular biology	Biochemistry
Land-grant Institutions		
Postdoctoral training positions	Molecular biology	Biochemistry
Permanent doctoral research associate postitions	Molecular biology	Biochemistry Horticulture/crop science
Tenure-track faculty positions	Molecular biology	Horticulture/crop science
Industrial positions	Molecular biology	Genetics Plant pathology
Federal/state government positions	Molecular biology	Agronomy/soil science

TABLE 9B

Disciplines Most Frequently Cited as Having a Surplus of Personnel, by Employment Category and Type of Institution

Employment Category	Most Frequently Cited Discipline	Second Most Frequently Cited Discipline
All Institutions		
Postdoctoral training positions	Ecology	Sytematics
Permanent doctoral research associate positions	Ecology	Anatomy/morphology
Tenure-track faculty positions	Ecology	Sytematics
Industrial positions	Ecology	Systematics
Federal/state government positions	Ecology	Systematics
Public Institutions		
Postdoctoral training positions	Ecology	Systematics
Permanent doctoral research associate postitions	Ecology	Anatomy/morphology
Tenure-track faculty positions	Ecology	Systematics
Industrial positions	Ecology	Systematics
Federal/state government positions	Ecology	Anatomy/morphology
Private Institutions		
Postdoctoral training positions	Ecology	Systematics
Permanent doctoral research associate postitions	Systematics	Ecology
Tenure-track faculty positions	Ecology	Systematics
Industrial positions	Ecology	Systematics
Federal/state government positions	Ecology	Systematics
Land-grant Institutions		
Postdoctoral training positions	Ecology	Systematics
Permanent doctoral research associate postitions	Ecology	Plant pathology
Tenure-track faculty positions	Ecology	Systematics
Industrial positions	Ecology	Anatomy/morphology Evolution Systematics
Federal/state government positions	Ecology	Anatomy/morphology Evolution

TABLE 10

Full-time Graduate Students and Postdoctoral Fellows in Plant Biology, by Major Source of Support, AY 1982-83

Source of Support	Full-time Graduate Students Number	Full-time Graduate Students Percent	Postdoctoral Fellows/associates Number	Postdoctoral Fellows/associates Percent
All Institutions (N = 165)				
Total	8,023	100.0	1,009	100.0
Federal fellowship	270	3.4	63	6.2
Federal research grant	1,586	19.8	545	54.0
State government	950	11.8	69	6.9
Foreign government[a]	840	10.5	107	10.6
Institutional support	2,400	29.9	75	7.5
Industry	520	6.5	84	8.3
Other non-industry non-personal support	293	3.6	58	5.7
Personal funds	1,164	14.5	8	0.8
Public Institutions (N = 118)				
Total	7,648	100.0	871	100.0
Federal fellowship	222	2.9	32	3.7
Federal research grant	1,513	19.8	492	56.4
State government	948	12.4	68	7.8
Foreign government[b]	827	10.8	93	10.7
Institutional support	2,204	28.9	61	7.0
Industry	514	6.7	74	8.5
Other non-industry non-personal support	285	3.7	45	5.2
Personal funds	1,135	14.8	6	0.7
Land-grant Institutions (N = 48)				
Total	6,442	100.0	731	100.0
Federal fellowship	187	2.9	25	3.4
Federal research grant	1,268	19.7	398	54.3
State government	807	12.5	63	8.7
Foreign government[c]	800	12.4	79	10.8
Institutional support	1,664	25.8	52	7.2
Industry	493	7.7	67	9.2
Other non-industry non-personal support	246	3.8	41	5.6
Personal funds	977	15.2	6	0.8

[a] The counts on this line represent 52 and 32 percent, respectively, of all foreign graduate students and postdoctorates in plant biology.

[b] The counts on this line represent 54 and 31 percent, respectively, of the foreign graduate students and postdoctorates in plant biology at public institutions.

[c] The counts on this line represent 57 and 32 percent, respectively, of the foreign graduate students and postdoctorates in plant biology at land-grant institutions.

TABLE 10--Continued

Full-time Graduate Students and Postdoctoral Fellows in Plant Biology, by Major Source of Support, AY 1982-83

Source of Support	Full-time Graduate Students Number	Full-time Graduate Students Percent	Postdoctoral Fellows/associates Number	Postdoctoral Fellows/associates Percent
Private Institutions (N = 47)				
Total	375	100.0	138	100.0
Federal fellowship	48	12.9	30	22.1
Federal research grant	74	19.7	54	38.8
State government	2	0.6	1	0.8
Foreign government[d]	12	3.3	14	9.8
Institutional support	195	51.9	15	10.6
Industry	7	1.7	10	7.4
Other non-industry non-personal support	8	2.1	12	8.9
Personal funds	29	7.8	2	1.6
20 Largest Institutions[e] (N = 20)				
Total	1,768	100.0	398	100.0
Federal fellowship	105	5.9	42	10.6
Federal research grant	482	27.3	201	50.5
State government	120	6.8	21	5.3
Foreign government[f]	117	6.6	34	8.5
Institutional support	515	29.1	24	6.0
Industry	156	8.8	37	9.3
Other non-industry non-personal support	81	4.6	35	8.8
Personal funds	192	10.9	4	1.0
Institutions Other Than the 20 Largest (N =145)				
Total	6,255	100.0	611	100.0
Federal fellowship	165	2.6	21	3.4
Federal research grant	1,104	17.6	344	56.3
State government	830	13.3	48	7.9
Foreign government[g]	723	11.6	73	11.9
Institutional support	1,885	30.2	51	8.3
Industry	364	5.8	47	7.7
Other non-industry non-personal support	212	3.4	23	3.8
Personal funds	972	15.5	4	0.7

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[d] The counts on this line represent 17 and 47 percent, respectively, of the foreign graduate students and postdoctorates in plant biology at private institutions.

[e] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

[f] The counts on this line represent 47 and 32 percent, respectively, of the foreign graduate students and postdoctorates in plant biology at the 20 largest responding institutions.

[g] The counts on this line represent 53 and 33 percent, respectively, of the foreign graduate students and postdoctorates in plant biology at institutions other than the 20 largest responding institutions.

TABLE 11A

Amount of Research Support for Plant Biology, by Type of Institution and Source, FY 1983

(Dollars in thousands)

Type of Institution	Total		Source of Support			
	Dollars	Percent	Federal Government	State Government	Industry	Other
(Number of Institutions)	(147)	(na)	(128)	(89)	(79)	(91)
All institutions	$201,569.6	100.0	$97,988.3	$69,023.7	$19,486.4	$15,071.2
Public institutions	186,959.5	92.8	87,774.7	69,000.1	17,243.7	12,941.0
Land-grant institutions	166,993.9	82.8	73,339.8	66,938.8	14,842.2	11,873.1
Private institutions	14,610.1	7.2	10,213.6	23.6	2,242.7	2,130.2
20 largest institutions[a]	36,923.8	18.3	19,959.9	9,506.3	4,253.4	3,204.2
Institutions other than the 20 largest	164,645.8	81.7	78,028.4	59,517.4	15,233.0	11,867.0

[a] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

TABLE 11B

Percentage Distribution of Research Support for Plant Biology, by Type of Institution and Source, FY 1983

	All	Federal Government	State Government	Industry	Other
All institutions	100%	48.6	34.2	9.7	7.5
Public institutions	100	47.0	36.9	9.2	6.9
Land-grant institutions	100	43.9	40.1	8.9	7.1
Private institutions	100	69.8	.2	15.4	14.6
20 largest institutions[a]	100	54.1	25.7	11.5	8.7
Institutions other than the 20 largest	100	47.4	36.1	9.3	7.2

[a] The 20 responding institutions with the largest federally financed R&D expenditures in the life sciences in FY 1982.

APPENDIX A: SURVEY INSTRUMENT

AMERICAN COUNCIL ON EDUCATION
ONE DUPONT CIRCLE
WASHINGTON, D. C. 20036

HIGHER EDUCATION PANEL
(202) 833-4757

October 6, 1983

Dear Higher Education Panel Representative,

Attached is Higher Education Panel Survey #62, "Plant Biology Training and Personnel." Sponsored by the National Science Foundation, its purpose is to obtain basic data concerning this emerging discipline.

Information is urgently needed for developing federal policy concerning plant biology. But it is a field in which little baseline data exist because it is composed of many subfields for which statistics are not separately identified and published. Thus, even the number of students, faculty, post-doctorates, and researchers in the field are not collected systematically or in such a way as to be identifiable with plant biology. This survey is designed to gather such data plus information on research support and opinions on the employment prospects of people trained in the field. Our pretest indicated strong interest in the survey on the part of plant biologists themselves.

You will note that this is a complex questionnaire and will require very specific, substantive knowledge of the discipline to complete. Consequently, instead of asking the HEP representative to determine the most appropriate respondent, the Foundation has requested that a specific individual act as plant biology coordinator on your campus. At your institution, the Foundation recommends that the survey be forwarded to:

If this person is no longer on your campus or is otherwise unavailable to act as coordinator, please designate an appropriate substitute, and let us know whom you select. We have included a preaddressed postcard for this purpose.

The importance of careful coordination for this particular survey cannot be overemphasized. We request that only one questionnaire be returned, and that it contain consolidated data from all of the units involved. The temptation to merely return a questionnaire for each department would severely diminish the usefulness of the effort, inasmuch as several questions require a single overview of the entire effort at your institution. This is another reason that we are asking that the data be assembled by a specialist in the field.

Please understand that your institution's response will be protected to the maximum extent permissible by law. As with all our surveys, the data you provide will be reported in summary fashion only and will not be identifiable with your institution. This survey is authorized by the National Science Foundation Act of 1950, as amended. Although you are not required to respond, your cooperation is needed to make the results comprehensive, reliable, and timely.

Please have the completed questionnaire returned to us by October 31, 1983. A preaddressed envelope is enclosed for your convenience. If you have any questions or problems, please do not hesitate to telephone us collect at (202)833-4757.

Sincerely,

Frank J. Atelsek

Frank J. Atelsek
Panel Director

Enclosures

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

October 6, 1983

Dear Colleague:

I am writing on behalf of the National Science Foundation because we urgently need your assistance in completing the attached survey on plant biology training and personnel. We are sending it to 210 doctorate-granting institutions in the United States; thus it is not possible to contact each person individually. We hope you will understand and agree to serve as your institutions's coordinator.

The need for the survey derived from numerous studies and reports that recommend plant biology as an area for emphasis in upcoming federal budgets. The National Academy of Sciences Briefing Panel on Agricultural Research Opportunities identified plant biology specifically as a research area that is "likely to return the highest scientific dividends as a result of incremental federal investments." However, planning for such a major emphasis requires having at hand accurate information about the numbers and specialties of faculty, postdoctorates and graduate students in plant biology, the major areas of concentration of training and research, sources of support, estimates of faculty vacancies and employment prospects of plant biologists. Very little baseline data now exist because plant biology and its various subfields are not separately identified and published by extant data sources. Therefore, we at the National Science Foundation have asked the Higher Education Panel, a survey research program operated by the American Council on Education, to conduct this survey for us. We believe that the resultant information will be useful for federal agencies that support plant biology research and also universities, industry and professional societies.

As you read the eleven questions of the questionnaire you will understand why it is essential to have a plant biologist coordinate the data collection. As a plant biologist you can readily identify the various departments and research and teaching programs that involve plant biologists at your institution. Indeed, you will know that those programs and persons may reside in more than one college or division. We realize that the questionnaire is complex and that several items will require a substantial effort. However, we believe you will understand our objectives and will spend the time required to collect and aggregate your institution's data.

It is important for you to work with the Higher Education Panel Representative at your institution who forwarded the questionnaire. It will also probably be necessary for you to work with plant biologists in other departments to produce complete and accurate data. Remember it is important for the survey to include all appropriate plant biologists not just those in your department.

Please feel free to call the Higher Education Panel staff collect at (202) 833-4757 if there are any questions or problems.

Thank you for your assistance. We believe the goal will be worth our combined efforts.

Mary E. Clutter
Mary E. Clutter
Division of Physiology, Cellular
and Molecular Biology
National Science Foundation

AMERICAN
COUNCIL ON
EDUCATION

OMB #3145-0009
Exp. 6/30/84

Higher Education Panel Survey No. 62

PLANT BIOLOGY TRAINING AND PERSONNEL

1. Please indicate the major administrative unit at your institution that is the primary focus for training graduate students in plant biology. *Check only one.*

___ a. Division/College of Arts and Sciences
___ b. School/College/Division of Agriculture/Forestry/Natural Resources
___ c. Other; specify. ______________________________

Please complete the remainder of this questionnaire with reference to *ALL* graduate plant biology personnel and training at your institution.

2. Please list the department(s) involved in training graduate students in plant biology in 1982–83 at your institution. For each department, indicate (1) the total number of *plant biology* faculty and (2) the number of those faculty *engaged in training graduate students*. Count faculty members only once, i.e., with their major departmental affiliation.

If more than four departments are involved in training graduate students in plant biology, please list those in excess of four in the "Supplement" section on page 5.

		Number of Full-Time Plant Biology Faculty	
Rank*	**Department**	**Total**	**Training Graduate Students**
1st	______________________	______	______
2nd	______________________	______	______
3rd	______________________	______	______
4th	______________________	______	______

*As measured by the number of full-time graduate students in plant biology.

3. Please show the number of full-time graduate students, Ph.D. recipients, postdoctoral fellows/associates, and faculty in your plant biology program(s). For 1982–83, categorize the data by sex; for 1983–84, show only estimated totals. Note that the 1982–83 totals for graduate students and postdoctorates should agree with corresponding totals in question 10.

	1982–83			1983–84 Total (Estimate)
	Total	**Males**	**Females**	
a. Full-time graduate students	______**	______	______	______
b. Ph.D. recipients (degrees awarded)	______	______	______	______
c. Postdoctoral fellows/associates	______**	______	______	______
d. Full-time faculty	______	______	______	______

**These figures should agree with the corresponding totals in question 10.

4. Of the 1982–83 totals shown in the preceding question, how many were members of those racial/ethnic groups shown in "Definitions"? Include only *U.S. citizens* and non-citizens who have *permanent resident* status.

a. Full-time graduate students ____
b. Ph.D. recipients (degrees awarded) ____
c. Postdoctoral fellows/associates ____
d. Full-time faculty ____

5. How many *foreign* full-time graduate students and postdoctoral fellows/associates were in your 1982–83 plant biology program(s)? Please show men and women separately. Also show the total number of these individuals (men plus women) who were from *Developing Countries* (see "Definitions" for a list). **Count as foreign students and postdoctorates those non-U.S. citizens on temporary visas.**

	Number of Men	**Number of Women**	**Number from Developing Countries**
a. Foreign graduate students	______	______	______
b. Foreign postdoctorates	______	______	______

6. Indicate *in rank order* the three major disciplines that best characterize the areas of greatest concentration in your plant biology program(s) for (a) graduate students, (b) postdoctorates, and (c) faculty. Select a code from the list below and place it in the column that represents its appropriate rank.

Type of Training/research	**Highest Ranking Discipline**	**2nd Highest Ranking Discipline**	**3d Highest Ranking Discipline**
a. Graduate student training	______	______	______
b. Postdoctoral research and training	______	______	______
c. Faculty research	______	______	______

DISCIPLINE CODES

A. Agronomy/soil science
B. Anatomy/morphology
C. Biochemistry
D. Cell biology
E. Developmental biology
F. Ecology
G. Evolution
H. Forestry/natural resources
I. Genetics
J. Horticulture/crop science
K. Molecular biology
L. Plant pathology
M. Plant physiology
N. Systematics
O. Weed science
P. Other; specify. ____________
____

7. For the *discipline ranked highest for graduate student training* in the preceding question, indicate those fields shown in the list below in which students *are required* to take courses—or to have taken courses during their undergraduate study.

______ a. Biochemistry
______ b. Genetics
______ c. Plant structure (anatomy/morphology)
______ d. Ecology/evolution
______ e. Plant physiology

8. Faculty vacancies in plant biology.
   a. How many full-time faculty vacancies (budgeted positions) exist as of fall 1983 in all of your plant biology programs? ______
   b. In which discipline is the need to fill vacancies greatest? Use a discipline code from question 6. ______

   To what do you attribute this need? Check the *single most important*.

   ______ (1) Increased graduate enrollments

   ______ (2) Faculty retirements/departures

   ______ (3) Research opportunities

   ______ (4) Other; specify. ____

   ____

9. How would you characterize the "current market" for employment in plant biology?

In column 1, for each of the employment categories, enter the code for the discipline(s) in which there is a *surplus of positions*. Use discipline codes from question 6. A surplus of positions means a condition in which there are more positions available than trained people to fill them.

In column 2, for each of the employment categories, enter the code for the discipline(s) in which there is a *shortage of positions*. A shortage of positions means that there are not enough positions for all the qualified people who are applying for them.

If, in your opinion, there is a condition of equilibrium across all fields in any of the employment categories, enter a check mark in column 3.

Employment Category	Column 1 Discipline(s) with *Surplus* of Positions	Column 2 Discipline(s) with *Shortage* of Positions	Column 3 Equilibrium Across Disciplines
a. Postdoctoral training positions	______	______	______
b. Permanent doctoral research associate positions	______	______	______
c. Tenure-track faculty positions	______	______	______
d. Industrial positions	______	______	______
e. Federal/state government positions	______	______	______

10. Show the number of full-time graduate students and postdoctoral fellows/associates in your plant biology program(s) by their *major* source of support. Count each individual only once. The totals should agree with the corresponding totals in question 3.

Source	Graduate Students	Post-Doctorates
a. Federal fellowship	______	______
b. Federal research grant	______	______
c. State government	______	______
d. Foreign government	______	______
e. Institutional support	______	______
f. Industry	______	______
g. Other non-industry, non-personal support (foundations, associations etc.)	______	______
h. Personal funds	______	______
i. TOTAL	______	______

⇦ These totals should agree with corresponding totals in question 3.

11. Indicate the amount of support for plant biology *research* that your institution received in FY 1982–83 from each of the sources listed below. If exact figures are not yet available, please show estimates. If a multi-year award was received in FY 1982–83, show only that portion that supported research conducted during the year.

Source	Amount
a. Federal government	$ ________
b. State government	$ ________
c. Industry	$ ________
d. Other private support (foundations, associations, etc.)	$ ________
e. TOTAL	$ ________

Thank you for your assistance. Please return this form by October 31, 1983 to:

Higher Education Panel
American Council on Education
One Dupont Circle Suite 829
Washington, DC 20036

Please keep a copy of this survey for your records.
Person completing form:

Name ____________________

Title ____________________

Telephone (   ) ____________________

If you have any questions or problems concerning this survey, please call the HEP staff collect at (202) 833-4757.

Supplement to Question 2
Additional Departments with Plant Biology Training for Graduate Students

If your institution has more than four departments involved in training graduate students in plant biology, continue below the list that was begun in question 2. For each department, indicate (1) the total number of *plant biology* faculty and (2) the number of those faculty *engaged in training graduate students.* Count faculty members *only once,* i.e., with their major departmental affiliation.

	Number of Full-Time Plant Biology Faculty	
Department	**Total**	**Training Graduate Students**

DEFINITIONS

Developing Countries by Region

Latin America and the Caribbean: Includes Central America, Mexico, South America and the Caribbean

Far East, excluding Japan: Includes China, Burma, Thailand, the Philippines, Malaysia, Indonesia, and others

South Asia: Includes India, Afghanistan, Bangladesh, Pakistan, and Sri Lanka

Africa South of the Sahara *excluding* South Africa

Near and Middle East and North Africa: Includes Turkey, Iran, Saudi Arabia and other Middle East countries; included in North Africa are Morocco, Algeria, Tunisia, Libya, Egypt, Mauritania, Mali, Niger, Chad, and Sudan.

Racial/ethnic Groups

American Indian/Alaskan Native

Black, non-Hispanic

Asian or Pacific Islander

Hispanic

Full-time Faculty

Individuals with regular, full-time faculty appointments (both tenured and nontenured), *excluding* postdoctoral fellows/associates.

Postdoctoral Fellow/associate

Individual with a doctorate (Ph.D, Sc.D., etc.) or with a professional degree (M.D., D.D.S., D.V.M., etc.) who, under temporary appointment carrying no academic rank, devotes full-time to research activities or study, usually for a specified period.

APPENDIX B: TECHNICAL NOTES

The institutional population for this survey was defined to include institutions that had awarded five or more doctorates in 1980 in the arts and sciences and engineering combined. Excluded were doctorate-granting professional schools of medicine, allied health professions, business, law, fine and performing arts, and theology.

The questionnaire was mailed to a group of 209 institutions. Data received from returned questionnaires, supplemented by information obtained from follow-up telephone calls, degree-production records, and catalogs permitted the identification of 165 doctorate-granting institutions with graduate programs in plant biology. Of these 165 institutions, 143 responded to the survey questionnaire with substantive data, for an overall response rate of 87 percent.

At the time the survey was being initiated, the finishing touches were being put on the redesigned Higher Education Panel. Because there was a very high overlap of doctorate-granting institutions between the old and the new Panels, it was decided that the new Panel's weighting and institutional classification procedures should be used in calculating the national estimates. The following table shows the population and responses categorized according to the revised Panel stratification design.

Weighting

Data from the responding institutions were statistically adjusted to represent the population of doctorate-granting institutions with graduate plant biology programs. The weighting technique used was the standard one employed for Panel surveys. Data received from Panel members were adjusted for item and institutional nonresponse within each cell. Then institutional weights were applied to bring Panel data up to estimates representative of the national population.

Comparison of Respondents and Nonrespondents

Table B-2 compares survey respondents and nonrespondents on the basis of several variables. Higher-than-average response rates were recorded for institutions with large graduate enrollments and private institutions generally. Eastern and western institutions and those with graduate full-time-equivalent enrollments ranging from 2,000 to 5,000 students had lower-than-average response rates.

Reliability of Survey Estimates

Because the statistics presented in this report are based on a sample, they will differ somewhat from the figures which would have been obtained if a complete census had been taken using the same survey instrument, instructions, and procedures. As in any survey, the results are also subject to reporting and processing errors and errors due to nonresponse. To the extent possible, these types of errors were kept to a minimum by methods built into the survey procedures.

The standard error is primarily a measure of sampling variability--that is, the variations that might occur by chance because only a sample of the institutions is surveyed. The chances are about 90 out of 100 that an estimate from the sample would differ from a complete census by less than

Table B-1--Stratification Design

Cell	Type of Institution	All Doctoral Institutions	Institutions with Graduate Plant Biology: Total	Institutions with Graduate Plant Biology: Respondents
	Total	209	165	143
01	Public doctorate-granting	103	98	82
02	Private doctorate-granting	56	36	32
03	Large public comprehensive (FTE >9,000)	24	15	14
04	Large private comprehensive (FTE >9,000)	9	5	5
05	Large public specialized	1	1	1
06	Large private specialized	2	--	--
08	Public comprehensive (FTE 5,000 - 9,000)	2	2	2
09	Public comprehensive (FTE <5,000)	3	2	1
10	Private comprehensive (FTE <9,000)	7	4	4
16	Medium to small private specialized	2	2	2

Excludes institutions that awarded less than 5 doctorates in the arts and sciences and engineering combined in 1980 and doctorate-granting professional schools of medicine, allied health professions, business, law, fine and performing arts, and theology.

1.65 times the standard error; about 95 out of 100 that it would be less than 1.96 times the standard error; and about 99 out of 100 that it would be less than 2.5 times as large. Thus, knowing the standard error permits us to specify a range within which we can have a stated confidence that a given estimate would lie if a complete census, rather than a sample survey, had been conducted. As an example, refer to table B-3 to the estimated number of graduate students at all institutions--8,023. The 90 percent confidence interval for that item is plus or minus 616. Thus, chances are 90 out of 100 that a complete census would show the number of graduate students to be more than 7,407, and less than 8,639.

Table B-3 shows 90 percent confidence intervals of selected survey items for all institutions and for land-grant and private institutions separately.

Table B-2--Comparison of Respondents and Nonrespondents
(In percenteges)

Institutional Characteristic	Respondents (N=143)	Nonrespondents (N=22)	Response Rate
Total	100.0	100.0	86.7
Control			
Public	69.9	81.8	84.7
Private	30.1	18.2	91.5
Region			
East	18.9	27.3	81.8
South	34.9	22.7	90.9
Midwest	25.9	18.2	90.2
West	20.3	31.8	80.6
Total graduate full-time equivalent enrollment (1980)			
Less than 1,000	28.7	18.2	91.1
1,000-1,999	33.5	27.3	88.9
2,000-4,999	30.1	50.0	79.6
5,000 and above	7.7	4.5	91.7

Table B-3--Ninety Percent Confidence Intervals for Selected Survey Estimates

	All Institutions		Land-grant Institutions		Private Institutions	
Item	Estimate	Confidence Intervals±	Estimate	Confidence Intervals±	Estimate	Confidence Intervals±
Graduate students	8,023	616	6,442	585	375	44
Ph.D.'s awarded	925	98	740	113	57	10
Postdoctorate fellows/associates	1,009	111	731	131	138	21
Full-time (program) faculty	4,607	342	3,674	328	263	18
Graduate students whose principal support came from:						
State governments	950	111	807	127	a	a
Institutional funds	2,400	169	1,664	175	195	20
Postdoctoral fellows whose principal support came from:						
State governments	69	13	63	17	a	a
Institutional funds	75	11	52	13	a	a
Research support[b]						
Total	$201,569.6	$20,221.6	$166,993.9	$22,520.1	$14,610.1	$2,122.5
Federal	97,988.3	9,567.0	73,339.8	10,965.1	10,213.6	1,678.1
State	69,023.7	9,530.1	66,938.8	11,525.8	c	c
Industry	19,486.4	2,100.6	14,842.2	2,339.6	2,242.7	486.7

[a] Estimate is less than 20; confidence interval not calculated.
[b] Estimates are in thousands of dollars.
[c] Estimate is less than $25,000; confidence interval not calculated.

APPENDIX C

50 Institutions with the Largest
Federally Financed Research and Development Expenditures
in the Life Sciences, FY 1982

Rank	Institution
1	University of California, San Francisco
2	Johns Hopkins University
3	University of Washington
4	University of Minnesota
5	Harvard University
6	Columbia University, Main Division
7	Yale University
8	University of Pennsylvania
9	University of Wisconsin, Madison
10	Stanford University
11	University of California, Los Angeles
12	Washington University
13	Yeshiva University
14	Cornell University
15	University of California, San Diegeo
16	University of Michigan
17	Duke University
18	University of Chicago
19	University of California, Davis
20	Baylor College of Medicine
21	New York University
22	University of Rochester
23	University of Alabama, Birmingham
24	University of North Carolina, Chapel Hill
25	University of Colorado
26	University of Iowa
27	University of Southern California
28	University of Texas Health Science Center, Dallas
29	University of California, Berkeley
30	University of Connecticut
31	University of Pittsburgh
32	Boston University
33	Michigan State University
34	University of Miami
35	University of Utah
36	University of Arizona
37	CUNY Mount Sinai School of Medicine
38	Massachusetts Institute of Technology
39	University of Florida
40	Case Western Reserve University
41	Ohio State University
42	Oregon State University
43	Pennsylvania State University
44	Virginia Commonwealth University
45	Rockefeller University
46	Northwestern University
47	Texas A & M University
48	Emory University
49	Vanderbilt University
50	University of California, Irvine

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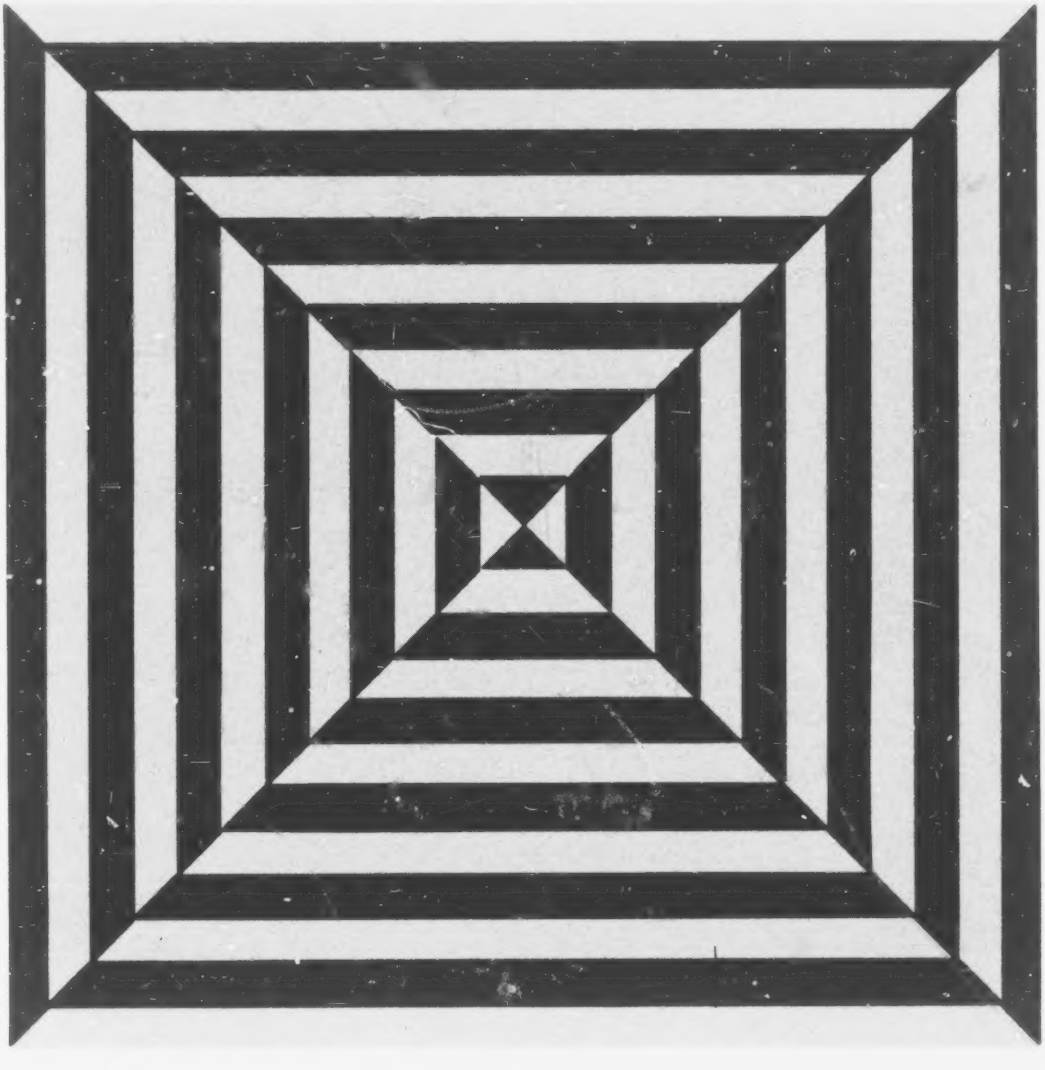
CAMPUS TRENDS, 1984

Elaine El-Khawas



HIGHER EDUCATION PANEL REPORT NUMBER 65

FEBRUARY 1985

A Survey of the American Council on Education

AMERICAN COUNCIL ON EDUCATION

Robert H. Atwell, President

The American Council on Education, founded in 1918, is a council of educational organizations and institutions. Its purpose is to advance education and educational methods through comprehensive voluntary and cooperative action on the part of American educational associations, organizations, and institutions.

The Higher Education Panel is a survey research program established by the Council for the purpose of securing policy-related information quickly from representative samples of colleges and universities. *Higher Education Panel Reports* are designed to expedite communication of the Panel's survey findings to policy-makers in government, in the associations, and in educational institutions across the nation.

The Higher Education Panel's surveys on behalf of the Federal Government are conducted under support provided jointly by the National Science Foundation, The National Endowment for the Humanities, and the U.S. Department of Education (NSF Contract SRS-8117037).

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Campus Trends, 1984

Elaine El-Khawas

Higher Education Panel Reports
Number 65 February 1985

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Data processing services for the survey were ably provided by Boichi San and Bernard Greene, ACE Division of Policy Analysis and Research. Irene L. Gomberg, former Assistant Director of the Higher Education Panel, was also involved in the development and design of this survey.

Special appreciation is extended to the Higher Education Panel campus representatives and academic officers who responded to the survey. Our hope is they will find the survey's results offer good perspective on present-day campus policies and practices.

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HIGHLIGHTS

A June 1984 survey reveals that colleges and universities are giving considerable attention to the quality of the curriculum, to admissions and graduation requirements, and to programs and services responsive to a changing population of students. Key findings include:

- Almost all institutions are in the midst of curriculum change. About 6 in 10 are reviewing their curricula, and another 3 in 10 have just completed a review. New general education requirements are being developed, and greater attention is being paid to competencies and skills learned by students.
- Close to half of colleges and universities are reviewing or recently completed a review of admissions requirements, especially to raise or be more specific about requirements or to review the role of test scores in the admissions process.
- Four out of 10 institutions have institution-wide writing requirements for all of their students. Two-thirds of institutions require that all entering students take placement tests in mathematics and in English.
- Among four-year colleges and universities, about 2 in 10 require foreign language study as part of their graduation requirements for all students. Another 3 in 10 of these institutions have foreign language requirements for some students.
- Many institutions (62 percent) currently offer special programs focusing on student retention. Most (78 percent) also offer courses on "coping with college."
- Among colleges with teacher education programs, most (76 percent) report that they have tightened their standards in recent years.
- Close to half of all colleges and universities offer courses, both credit and noncredit, on business premises for business employees.
- About two-thirds of the nation's colleges and universities sponsor faculty development programs. Workshops or symposia are typical components of these programs, as are individualized approaches to faculty development.
- At about 4 in 10 institutions, administrators reported that levels of faculty morale and compensation were better than they were 5 years ago. Fewer than 1 in 5 said that morale and compensation levels had worsened.
- Administrators at 4 in 10 institutions also reported that relationships with state agencies were better than 5 years ago. Very few (3 percent) reported worsening relationships.

BACKGROUND

This report marks the beginning of a new project of the Division of Policy Analysis and Research of the American Council on Education. The Campus Trends project is designed to provide the higher education community with timely overviews of trends apparent at colleges and universities throughout the nation. Its creation reflects the belief of the Council that information gathered periodically on recent and pending changes affecting academic institutions will strengthen the status of higher education in the community at large.

In this first report, a variety of policies and practices are described that were current at American colleges and universities in 1983–84. The broad area of curricular review is examined in the report, as are admissions and graduation requirements presently in effect. The report also offers information on such key issues as faculty hiring, morale, retirements, and related matters. In addition, college linkages with business and industry are detailed and the opinions of campus administrators are reported on a range of issues relating to their institutions.

METHODS SUMMARY

The Higher Education Panel forms the basis of an ongoing survey research program created in 1971 by the American Council on Education. Its purpose is to conduct specialized surveys on topics of current policy interest to the higher education community and to government agencies.

The Panel is a disproportionate stratified sample of 1,040 colleges and universities, divided into two half-samples of 520 institutions each. Institutions were drawn from the more than 3,200 colleges and universities listed in the National Center for Education Statistics' *Education Directory, Colleges and Universities*. All institutions in the population are grouped according to the Panel's stratification design, which is based primarily upon institution type (doctorate-granting, comprehensive, baccalaureate, specialized, and two-year academic or occupational), control (public, private), and size (full-time-equivalent enrollment). For any given survey, either the entire Panel, a half-sample, or an appropriate subgroup is used.

The survey operation is dependent upon a network of campus representatives who, through their presidents, have agreed to participate. The representatives receive the Panel questionnaires and direct them to the most appropriate campus officials for response.

The survey sample consisted of all two-year colleges, four-year colleges, and universities in one of the half-samples. Excluded were specialized and religious institutions, which brought the total survey sample to 458 institutions. The questionnaire (see Appendix A) was mailed in two stages so that 15 percent of the institutions included in another HEP survey under way would not be unduly burdened. The first mailing went out in late June; the second followed a month later.

Senior administrative officials were asked to provide general information on campus trends in various areas, including course offerings, college costs, and requirements for admissions and graduation. In addition, they were queried on their opinions and judgments about recent changes affecting their institutions. After a series of mail and telephone follow-ups, usable responses were received from 413 institutions, or 90 percent of those surveyed.

Data from responding institutions were statistically adjusted (weighted) to represent 2,623 four- and two-year colleges and universities. (Institutional weights are based on the ratio of the number of respondents to the number of institutions in the population, separately for the strata used in the survey.)

The technical notes (see Appendix B) contain a description of the weighting methodology and comparison of respondents and nonrespondents.

FINDINGS

A strong impression that emerges from the survey results is that higher education is in the midst of substantial curricular change. Colleges of all types are addressing the issue of new general education requirements and are giving greater emphasis to the competencies and skills learned by students. In addition, close to half of all colleges and universities are reviewing admissions requirements, especially with regard to raising their requirements, and reviewing the role of standardized test scores in the admissions process.

It also appears that many of the reforms of the last few years proposed for higher education have been adopted by higher education institutions. Four out of 10 institutions had college-wide writing requirements. Over half—55 percent—were reviewing their admissions requirements in order to include special procedures for older students. Two-thirds have faculty development programs. Most have some form of cooperation established with business and industry.

Problems and shortcomings are documented as well. Only a few institutions require either comprehensive exams in a student's major or study of a foreign language. At 1 in 5 colleges, equipment for teaching and research and the level of faculty compensation were judged to be worse than 5 years ago.

Changes in the Curriculum

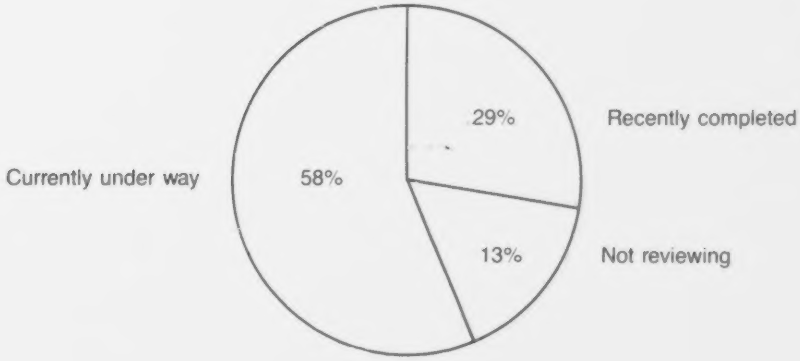
Most American colleges and universities were engaged in curriculum review during the past year (see figure 1). About 6 in 10 institutions were reviewing their curricula; another 3 in 10 had just completed a review.

At almost all institutions, this review involved new general education course requirements. Most institutions also reported giving greater emphasis to competencies and skills of students (see figure 2), which probably reflects a general focus on what students are learning, rather than any substantial move toward competency-based curricula.

A number of differences by type of institution can be noted (see table A). Efforts to give greater flexibility to adult learners were reported by more than half of the two-year colleges, but by 4 in 10 of other colleges. Close to half of the four-year colleges and universities were giving greater attention to foreign language study; a much smaller proportion of two-year colleges were doing so. Another contrast appears with respect to career preparation interests of students: although 40 percent of universities were considering giving greater attention to career preparation in their curricular review, fully two-thirds of other colleges were doing so.

Detailed table 1 offers a look at a variety of special course and program offerings available in colleges and universities. The general picture is that practices vary substantially among institutions. Honors programs are offered by about half of all institutions, but by seven-eighths of the universities. While about 40

FIGURE 1
Status of Curricular Review, All Institutions
(N = 2,623)



Reference: Detailed table 2

TABLE A—Areas of Curricular Review, by Type of Institution
N = 2,289
(In percentages)

	Two-year Institutions (N = 1,106)	Four-year Institutions (N = 664)	Universities (N = 519)
New general education requirements	82	92	95
Greater emphasis on competencies and skills	90	89	85
Increased course requirements	45	59	61
Greater flexibility for adult learners	56	39	38
Foreign language study	21	49	45
Career preparation	63	71	41

Reference: Detailed table 2

percent of all institutions offer courses in international studies, only 24 percent of 4-year colleges and 31 percent of universities offer a major in this field.

Courses designed to help students with needed skills are frequently reported. More than 90 percent of all institutions have courses to improve writing skills of students; 78 percent reported courses on how to cope with or survive in college; 67 percent reported career planning courses; and 62 percent offer special programs focusing on student retention. Academic credit for remedial or developmental courses is offered by 60 percent of the institutions. In contrast, only a small number offer external degree programs (19 percent) or weekend colleges (16 percent).

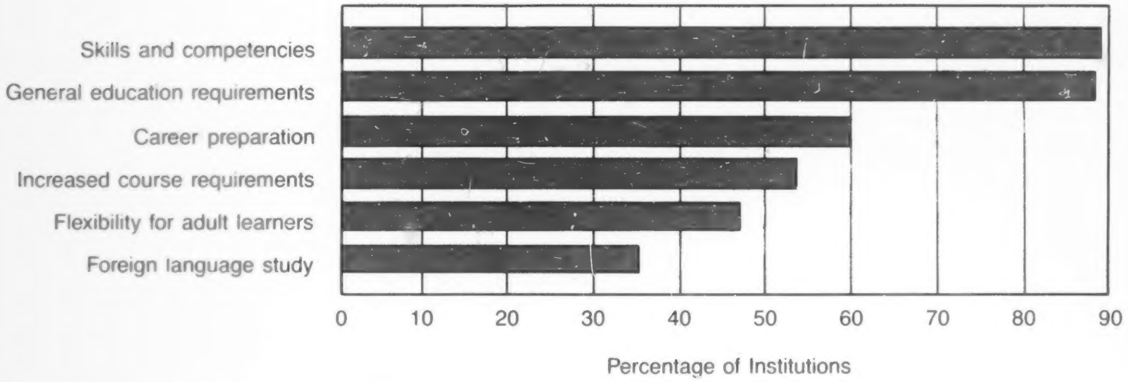
Detailed table 1 also documents that women's studies courses are offered by 42 percent of institutions, although very few (3 percent) offer it as a major. This pattern is also reflected in Black studies courses (7 percent offer a major, but 35 percent offer courses in the area), in Hispanic studies (6 percent offer a major, but 23 percent offer courses), and in Asian/Pacific American studies (4 percent offer a major, but 24 percent offer courses).

Teacher training has received a great deal of attention in the months following the release in April 1983 of the report of the National Commission on Excellence in Education, *A Nation at Risk* (published by the U.S. Department of Education). Questions in this survey obtained information on current or future requirements of teacher-training programs (see detailed table 3).

Close to 90 percent of four-year colleges and universities have teacher-training programs. Among these programs, the percentages reporting various selected characteristics were as follows:

	Percentage of Institutions (N = 1,159)
A major or minor is required in a discipline for students in secondary education.	92
There are minimum requirements for entering the program.	89
The program has tighter standards now than a few years ago.	76
Special recruitment efforts are made to attract the best students.	33
The program includes a fifth year of study.	12

FIGURE 2
Areas of Curricular Review
(N = 2,289)



Reference: Detailed table 2

Especially notable is the move toward tighter standards, reported by three-quarters of these programs. The survey also documents that students in secondary education are generally required to take subject-matter courses in a discipline, a fact that has often been overlooked in recent debate about the quality of teacher-training programs.

Graduation Requirements

Many observers have argued that colleges today have few graduation requirements beyond a specified number of course credits that must be accumulated. Results of this study do not support such a simplistic view.

Almost all institutions require that a core amount of general education courses must be completed by some or all students (see figure 3). This is particularly true of four-year colleges and universities; among two-year institutions, 62 percent require core courses of all students, while another 25 percent require such courses of some students. In light of the general review of curriculum that is occurring at most institutions, these results are likely to change.

College practice varies considerably on other graduation requirements. Institution-wide writing requirements are quite prevalent, possibly a reflection of the efforts to strengthen "writing across the curriculum" during the last decade. Writing requirements for all students were reported by 60 percent of four-year colleges, 51 percent of universities, and by 26 percent of two-year institutions (see table B).

In contrast, relatively few institutions have foreign language requirements for all students for graduation. About 1 in 5 four-year colleges and universities do so, although another 28 percent impose such graduation requirements on some of their students (see detailed table 5).

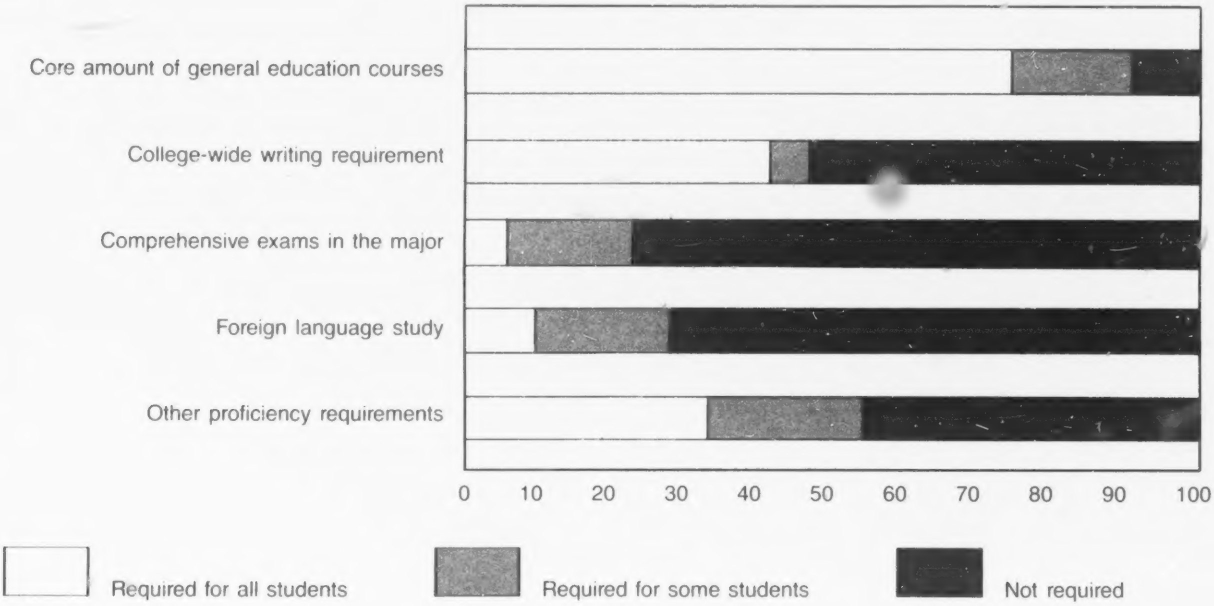
Comprehensive exam requirements in a student's major vary by type of institution. Few universities (3 percent) and a small number of four-year colleges (17 percent) require such exams of all students, but larger percentages (31 percent of universities and 21 percent of four-year colleges) reported that comprehensive exams are required of some students (see detailed table 5).

Admissions Requirements

College admissions practices have also been subject to questioning since the release of *A Nation at Risk*. A major concern has been that admissions requirements are too lax.

FIGURE 3

Selected Graduation Requirements, All Institutions
(N = 2,623)



Reference: Detailed table 5

TABLE B—College-wide Writing Requirements, by Type of Institution
N = 2,623
(In percentages)

	Two-year Institutions (N = 1,311)	Four-year Institutions (N = 739)	Universities (N = 573)
Required for *all* students	26	60	51
Required for *some* students	8	3	9
Not required	66	37	40

Reference: Detailed table 5

Survey results show that just under two-thirds of the institutions require students to take placement tests (or otherwise meet requirements) in mathematics and just over two-thirds of the institutions require such tests in English (see figure 4). About one-fifth do not require all students to take such tests, but do require some students to meet basic requirements.

It also appears that a good many institutions are reviewing their admissions requirements in response to recent challenges. One-third overall were engaged in such a review at the time of the survey. Another 1 in 6 had recently completed a review. The primary areas for attention in these reviews were as follows: raising admissions requirements; reviewing the role of test scores; specifying courses needed for admissions; and developing special procedures for older students (see figure 5).

Compared to other types of institutions, two-year institutions were less likely to be specifying courses for admissions or otherwise raising requirements; however, they were more likely than others to be reviewing the role of test scores and considering special procedures for older students (see detailed table 4).

The perceptions of administrators of the quality of entering students were mixed. Over half reported that the ability to attract good students was better than 5 years ago. At the same time, just over half said that the general level of preparation of the entering students was "about the same" as 5 years ago. About 3 in 10 said that student preparation was better than it was 5 years ago (see detailed table 10).

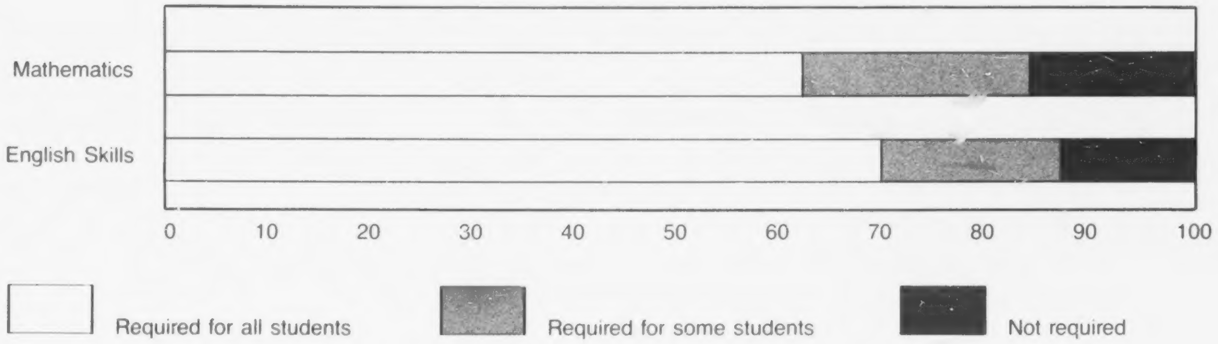
Easing the Burden of Tuition Costs

At a time when college costs have been rising somewhat ahead of inflation, colleges have developed a number of practices intended to ease the burden for families and students in meeting tuition costs. Extended payment plans are one example, in which payments for a year's tuition can be made on a monthly basis, extended over the full calendar year, or might be extended beyond graduation. Overall, 44 percent of all institutions have an extended payment plan (see detailed table 9).

Another option is for a college or university to offer its own loan program, usually to supplement loan funds available through government-sponsored programs. One in 3 colleges offer such programs at present. Differential tuition rates have sometimes been introduced by institutions, in recognition that some degree programs are more costly than others. Study results indicate that relatively few institutions (7 percent) have such a fee structure in place.

There is new interest in offering merit scholarships, which generally are not based on financial need. In this survey, a question was asked about one form of such scholarships, where an award is made to stu-

FIGURE 4
Placement Tests for Entering Freshmen, All Institutions
(N = 2,623)

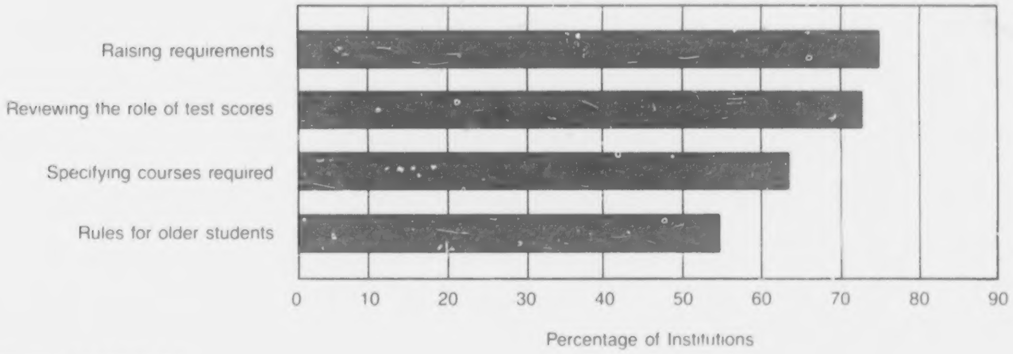


Reference: Detailed table 5

FIGURE 5

Areas of Admissions Requirements Review

(N = 1,247)



Reference Detailed table 4

dents that covers full tuition, room, and board. Results show that 30 percent of colleges offer such awards. It must be noted, however, that this figure may include athletic or artistic scholarships. To what extent is unknown.

Faculty Matters

Financial pressures facing colleges and universities in recent years have sometimes led to faculty layoffs and, more frequently, to considerably reduced hiring of full-time faculty and greater use of part-time faculty. In addition, faculty salaries generally have not kept up with inflation.

Such circumstances provide the context for interpreting this study's results on collegiate hiring practices in 1983–84. Thus, for example, only one-third of institutions registered a net gain in full-time faculty positions compared to a year earlier, and 22 percent had a net loss in positions (see table C). Although most institutions did hire full-time faculty during the past year, such hiring apparently represents replacement of faculty who leave. It can be noted that, among the colleges that hired new faculty, most reported that women were among those hired and about one-third reported that Black or Hispanic faculty were hired. These figures reflect institutional experiences and could, therefore, represent the hiring of one minority or woman faculty member at an entire college or university (see detailed table 7).

TABLE C—Number of Faculty Positions in 1983–84 Compared to a Year Earlier, All Institutions

N = 2,623

(In percentages)

	Two-year Institutions (N = 1,311)	Four-year Institutions (N = 739)	Universities (N = 573)
Net gain	28	39	44
Net loss	25	22	17
No change	47	39	39

Reference: Detailed table 7

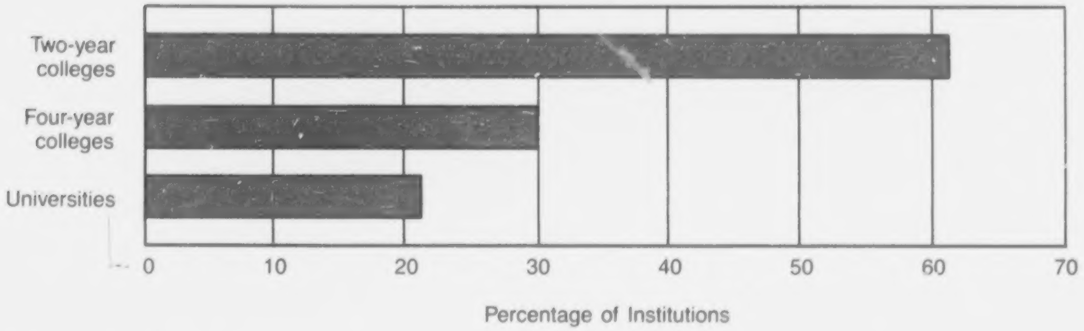
Extensive use of part-time faculty was found at two-year institutions and, to a more modest extent, at other institutions (see figure 6). Such use—defined here as involving part-time faculty in at least one-fourth of all courses—was reported by 61 percent of community colleges, by 21 percent of universities, and by 30 percent of four-year colleges.

Study results also suggest that many colleges and universities have developed early retirement policies. About one-quarter of community colleges and four-year colleges reported that full-time faculty took early retirement during 1983–84; a much higher percentage of universities—68 percent—reported that full-time faculty took early retirement (see detailed table 7). This difference may be a function of size. Many universities are larger than baccalaureate institutions and would be more likely to have faculty eligible for early retirement.

About two-thirds of the nation's colleges and universities sponsor faculty development programs. For these programs, workshops appear to be a typical component (mentioned by 91 percent of institutions), while released time for faculty to develop new course material is provided at only about half of the institutions (see table D). Individualized approaches to faculty development are also quite common (mentioned by 74 percent of institutions).

Eighty-two percent of institutions reported procedures for periodic evaluation of tenured faculty (see detailed table 7). In a third of these cases, such evaluation is done less frequently than once a year. More detailed questions would be necessary to clarify the nature of such evaluations. It is possible that, in many institutions, such an evaluation is largely perfunctory.

FIGURE 6
Institutions Using Part-time Faculty Extensively, All Institutions
(N = 2,623)



Reference: Detailed table 7

The views of campus administrators on the level of faculty morale, compensation, and related matters were generally positive. About 4 out of 10 administrators felt that the overall level of both faculty morale and compensation was better during 1983–84 than it had been 5 years ago (see detailed table 10). Even so, about 1 in 5 said that compensation was worse than it had been 5 years ago. The institutions' ability to attract good faculty was assessed in similar terms: about half of the administrators thought it was the same as 5 years ago, 43 percent thought it was better, and only 6 percent thought their ability to attract good faculty was worse than before.

TABLE D—Features of Formal Faculty Development Programs, by Type of Institution
N = 1,731
(In percentages)

	Two-year Institutions (N = 911)	Four-year Institutions (N = 486)	Universities (N = 334)
Workshops or symposia	97	87	81
Individualized approaches	72	76	76
Separate budget	60	74	74
Teaching improvement programs	65	57	72
Direction provided by coordinator	58	59	69
Released time for course development	55	52	61

Reference: Detailed table 8

Institutional Status

Several different survey items offer information on campus conditions and directions of activity (see detailed table 10). A majority of administrators (58 percent) said that the physical plant was in better condition than 5 years ago, although 12 percent said it was worse. Comments on the adequacy of equipment and library resources were less positive: about 4 in 10 thought conditions were better, and close to 2 in 10 thought that the condition of equipment and the library was worse than 5 years ago. Student aid was rated similarly: about 4 in 10 thought the adequacy of aid had improved, while 13 percent said it seemed worse (see table E).

When asked about how relationships with state agencies had changed, 4 in 10 administrators said that things were better than 5 years ago and very few—3 percent—reported worsening relationships. Regarding federal agencies, only one-quarter of administrators said that relationships were better than 5 years ago, although only 6 percent said things were worse.

Strong ties between business and higher education are also documented in the study findings (see table F). Joint meetings or advisory panels involving representatives of business and industry were reported at 7 in 10 institutions. Arrangements involving equipment (whether loaned, shared, or donated) are also quite common; they were reported at 65 percent of institutions. Half of the nation's colleges and universities report formal ties with business on scholarships or loan programs for students.

Many institutions offer courses—both credit and noncredit—for employees on business premises. Overall, just under half of all institutions reported such arrangements. Close to 60 percent of community colleges reported on-premise course offerings, while only one-quarter of four-year institutions had such offerings.

TABLE E—Administrators' Views on Changes During the Last Five Years, All Institutions

N = 2,623

(In percentages)

	Direction of Change		
	Better	Same	Worse
Students			
Ability to attract good students	57	36	7
General preparation of students	29	53	18
Job prospects for graduates	40	49	11
Faculty			
Overall faculty morale	42	45	13
Overall faculty productivity	38	58	4
Adequacy of faculty compensation	44	38	19
Ability to attract good faculty	43	51	6
Institutional Matters			
Relationships with state agencies	45	51	3
Relationships with federal agencies	24	70	6
Adequacy of student aid	42	45	13
Adequacy of equipment	44	39	18
Adequacy of library resources	41	44	15
Adequacy of physical plant	58	30	12

Reference: Detailed table 10

Although relatively few institutions (18 percent) have formal ties with business involving research, 52 percent of universities have such ties. Shared or on-loan staff is generally infrequent with only 2 in 10 of all institutions indicating that kind of arrangement. However, 3 out of 10 universities reported such staff linkages.

Relatively small proportions of institutions reported offering programs that were jointly developed and sponsored with business or industry. Overall, 2 in 10 institutions reported having joint programs, including 26 percent of community colleges. While the percentages are small, these figures suggest that a large number of institutions were involved in joint degree programs with business during 1983–84: an estimated 100 universities, 69 four-year institutions, and 338 community colleges.

TABLE F—Ties with Business and Industry, by Type of Institution, All Institutions

N = 2,623

(In percentages)

	Two-year Institutions (N = 1,311)	Four-year Institutions (N = 739)	Universities (N = 573)
Joint meetings or advisory panels	79	58	75
Equipment (loaned, shared or donated)	64	59	74
Scholarship or loan programs	48	43	73
Credit courses for employees	59	26	49
Noncredit courses for employees	59	27	50
Jointly sponsored degree programs	26	9	17
Shared or on-loan staff	16	16	28
Research	6	13	52

Reference: Detailed table 6

SUMMARY

This survey of various policies and practices at the nation's colleges and universities suggests that considerable attention is being paid to curriculum change and academic standards. It also gives evidence of the extent to which institutions, in the past, had responded to the diversity of students by imposing relatively few common requirements, beyond a core of general education, on all students.

The data also indicate that institutions are reexamining their graduation and course requirements, possibly to increase them. To be repeated in future years, the Campus Trends project should help document how these changes actually take place.

DETAILED STATISTICAL TABLES

Readers should note that some percentage distributions in the following tables may not total to 100 because of weighting and rounding.

TABLE 1—Institutions Offering Various Courses and Programs,
All Institutions

	Two-year Colleges 1311	%	Baccalaureates 739	%	Universities 573	%	All Institutions 2623	%
Credit or noncredit courses:								
1. Improving writing skills	1242	94.7	645	87.3	538	93.9	2425	92.5
2. Improving problem-solving	794	60.5	433	58.6	349	60.9	1576	60.1
3. Career planning	905	69.0	491	66.5	368	64.2	1764	67.3
4. Coping with college	1056	80.5	551	74.5	436	76.1	2042	77.9
5. Using personal computers	1100	83.9	526	71.2	422	73.7	2049	78.1
The institution offers:								
1. An external degree program	219	16.7	107	14.5	166	29.0	492	18.7
2. A weekend college program	148	11.3	118	16.0	147	25.6	413	15.7
3. Honors courses, sections or programs	423	32.3	436	59.0	488	85.2	1347	51.4
4. Special programs on student retention	836	63.7	418	56.5	361	63.1	1615	61.6
5. Remedial/development courses	939	71.6	355	48.1	282	49.3	1576	60.1
Undergraduate courses, as a major:								
1. International studies	38	2.9	174	23.5	179	31.2	390	14.9
2. National security issues	26	2.0	0	0.0	9	1.6	36	1.4
3. Soviet studies	6	0.5	43	5.8	102	17.8	151	5.8
4. Women's studies	11	0.8	7	0.9	54	9.3	71	2.7
5. Black studies	53	4.1	7	0.9	130	22.7	190	7.2
6. Hispanic studies	12	0.9	49	6.7	83	14.6	145	5.5
7. Asian/Pacific-American studies	13	1.0	19	2.5	68	11.8	100	3.8
Undergraduate courses, but not as a major:								
1. International studies	345	26.3	362	49.0	320	55.9	1027	39.2
2. National security issues	131	10.0	209	28.3	283	49.3	622	23.7
3. Soviet studies	139	10.6	350	47.4	289	50.4	778	29.7
4. Women's studies	348	26.5	361	48.9	390	68.1	1099	41.9
5. Black studies	249	19.0	382	51.7	273	47.7	904	34.5
6. Hispanic studies	203	15.5	177	24.0	231	40.3	611	23.3
7. Asian/Pacific-American studies	113	8.7	251	33.9	252	44.0	616	23.5

TABLE 2—Curricular Review Experiences, *All Institutions*

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
Currently reviewing:	805	61.4	387	52.3	326	56.9	1518	57.9
Recently completed:	301	22.9	277	37.5	193	33.7	770	29.4
Current or recent review:	1106	100.0	664	100.0	519	100.0	2288	100.0
1. New general education requirements	906	81.9	607	91.5	491	94.8	2005	87.6
2. Greater emphasis on competencies & skills	998	90.2	588	88.7	438	84.5	2024	88.5
3. An increase in course requirements	502	45.4	392	59.1	318	61.3	1213	53.0
4. Greater flexibility for adult learners	619	56.0	260	39.2	195	37.7	1075	47.0
5. New attention to foreign language study	234	21.2	328	49.4	232	44.7	794	34.7
6. Greater attention to career preparation	701	63.4	469	70.7	212	40.9	1382	60.4
Currently under way:	805	100.0	387	100.0	326	100.0	1518	100.0
1. New general education requirements	679	84.3	336	87.0	308	94.5	1323	87.2
2. Greater emphasis on competencies & skills	750	93.2	343	88.7	271	83.3	1365	89.9
3. An increase in course requirements	400	49.6	227	58.6	200	61.5	826	54.5
4. Greater flexibility for adult learners	492	61.1	124	32.1	138	42.2	754	49.7
5. New attention to foreign language study	211	26.2	187	48.4	160	49.3	558	36.8
6. Greater attention to career preparation	595	73.9	278	72.0	154	47.3	1027	67.7
Recently completed:	301	100.0	277	100.0	193	100.0	770	100.0
1. New general education requirements	228	75.6	270	97.7	184	95.2	682	88.5
2. Greater emphasis on competencies & skills	247	82.2	245	88.7	167	86.5	660	85.6
3. An increase in course requirements	103	34.1	166	59.8	118	61.1	386	50.1
4. Greater flexibility for adult learners	127	42.2	136	49.1	58	29.9	321	41.6
5. New attention to foreign language study	24	7.9	141	50.9	72	37.1	236	30.6
6. Greater attention to career preparation	106	35.1	191	69.0	58	30.0	354	46.0

TABLE 3—Institutions with Teacher-training Programs, By Selected Characteristics

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
Institutions with:	44	3.3 (100.0)	647	87.5 (100.0)	512	89.4 (100.0)	1203	45.9 (100.0)
1. Minimum requirements	26	60.2	578	89.5	451	88.1	1056	87.8
2. Special recruitment efforts	5	10.3	161	25.0	222	43.3	388	32.2
3. Tighter standards	33	74.5	489	75.6	395	77.1	916	76.2
4. A required major/minor in a discipline	26	60.2	622	96.1	448	87.5	1096	91.2
5. A fifth year of study	0	0.0	50	7.8	85	16.7	136	11.3
Institutions discussing instituting:								
1. Minimum requirements	0	0.0	13	2.1	37	7.3	51	4.2
2. Special recruitment efforts	26	60.2	176	27.2	120	23.3	321	26.7
3. Tighter standards	9	20.6	64	9.8	25	4.9	98	8.1
4. A required major/minor in a discipline	5	10.3	7	1.0	23	4.4	34	2.8
5. A fifth year of study	0	0.0	68	10.5	91	17.8	159	13.2
Institutions considering abolishing teacher-training programs	0	0.0	13	2.0	18	3.6	31	2.6

TABLE 4—Admissions Requirements Review Experiences

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
Currently reviewing admissions requirements:	332	25.3	273	37.0	234	40.9	840	32.0
Recently completed a review:	135	10.3	125	16.9	147	25.7	407	15.5
Currently reviewing:	332	100.0	273	100.0	234	100.0	840	100.0
1. Raising admissions requirements	151	45.4	217	79.2	216	92.2	583	69.5
2. Specifying courses for admissions	142	42.7	137	50.1	202	86.0	480	57.2
3. Special procedures for older students	210	63.3	125	45.9	113	48.3	449	53.5
4. Reviewing the role of test scores	269	80.9	210	76.9	152	64.7	631	75.1
Recently completed:	135	100.0	125	100.0	147	100.0	407	100.0
1. Raising admissions requirements	109	80.3	94	74.9	132	89.8	334	82.1
2. Specifying courses for admissions	122	90.3	74	59.4	107	72.8	303	74.5
3. Special procedures for older students	112	82.8	63	50.3	60	41.0	235	57.7
4. Reviewing the role of test scores	110	81.2	81	65.2	77	52.3	268	65.9
Currently reviewing or recently completed:	467	100.0	398	100.0	381	100.0	1247	100.0
1. Raising admissions requirements	259	55.5	310	77.9	348	91.3	917	73.6
2. Specifying courses for admissions	264	56.5	211	53.0	308	80.9	784	62.9
3. Special procedures for older students	323	69.0	188	47.3	173	45.5	684	54.9
4. Reviewing the role of test scores	379	81.0	292	73.3	228	59.9	899	72.1

TABLE 5—Admissions and Graduation Requirements, *All Institutions*

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
Requirements for all students:								
1. Placement test in:								
A. Mathematics	709	54.0	509	68.9	415	72.4	1632	62.2
B. English skills	752	57.4	596	80.6	483	84.3	1831	69.8
2. Foreign language study for:								
A. Admissions	0	0.0	81	11.0	104	18.1	185	7.0
B. Graduation	0	0.0	168	22.7	98	17.1	266	10.1
3. A core amount of general education courses	810	61.8	676	91.5	494	86.3	1981	75.5
4. Comprehensive exams for a major	0	0.0	124	16.8	19	3.4	143	5.5
5. Institution-wide writing requirements	345	26.3	447	60.4	293	51.1	1084	41.3
6. Other proficiency requirements for graduation	398	30.4	304	41.1	167	29.1	869	33.1
Requirements for some students:								
1. Placement test in:								
A. Mathematics	379	28.9	124	16.8	74	12.9	577	22.0
B. English skills	358	27.3	38	5.1	46	7.9	442	16.8
2. Foreign language study for:								
A. Admissions	38	2.9	31	4.2	49	8.6	118	4.5
B. Graduation	135	10.3	181	24.4	185	32.3	501	19.1
3. A core amount of general education courses	323	24.6	31	4.2	47	8.2	401	15.3
4. Comprehensive exams for a major	144	11.0	157	21.3	177	30.8	477	18.2
5. Institution-wide writing requirements	105	8.0	25	3.4	51	8.9	181	6.9
6. Other proficiency requirements for graduation	303	23.1	141	19.1	149	25.9	592	22.6

TABLE 6—Ties with Business and Industry,
All Institutions

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
Formal ties with business/industry in:								
1. Shared or on-loan staff	215	16.4	117	15.8	161	28.2	493	18.8
2. Research	77	5.9	92	12.5	298	52.1	468	17.8
3. Equipment	836	63.7	435	58.8	422	73.6	1692	64.5
4. Scholarship or loan programs	633	48.3	317	42.9	418	73.0	1369	52.2
5. Joint meetings or advisory panels	1032	78.7	427	57.7	431	75.2	1889	72.0
6. Credit courses for business employees	772	58.9	189	25.5	280	48.8	1241	47.3
7. Noncredit courses for business employees	777	59.3	201	27.2	285	49.7	1263	48.2
8. Jointly developed & sponsored degree programs	338	25.8	69	9.3	100	17.4	506	19.3
Formal ties under discussion:								
1. Shared or on-loan staff	198	15.1	95	12.9	87	15.2	380	14.5
2. Research	28	2.1	87	11.8	56	9.8	171	6.5
3. Equipment	123	9.4	58	7.8	43	7.5	223	8.5
4. Scholarship or loan programs	98	7.5	56	7.5	26	4.6	180	6.9
5. Joint meetings or advisory panels	74	5.6	92	12.5	32	5.6	198	7.6
6. Credit courses for business employees	165	12.6	100	13.5	86	15.0	351	13.4
7. Noncredit courses for business employees	111	8.5	95	12.8	76	13.2	282	10.7
8. Jointly developed & sponsored degree programs	191	14.6	69	9.4	77	13.5	338	12.9

TABLE 7—Changes in Faculty Positions Between 1982–84 and Selected Faculty Policies and Practices

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
Faculty positions in 1983–84 compared to 1982–83:								
1. A net loss	328	25.0	161	21.8	95	16.6	583	22.2
2. A net gain	363	27.7	288	39.0	252	44.0	903	34.4
3. No change	621	47.4	290	39.2	226	39.4	1137	43.3
Institutions that make extensive use of part-time faculty:	800	61.0	224	30.3	120	21.0	1145	43.7
Institutions reporting full-time faculty who took early retirement:	334	25.5	201	27.2	388	67.7	923	35.2
Institutions reporting new full-time faculty hired in 1983–84:	1073	81.8 (100.0)	678	91.8 (100.0)	565	98.7 (100.0)	2316	88.3 (100.0)
1. New women faculty	969	90.3	604	89.1	543	96.0	2116	91.3
2. New Black or Hispanic faculty	319	29.8	180	26.6	365	64.6	865	37.3
Institutions that periodically evaluate tenured faculty:	1117	85.2 (100.0)	589	79.8 (100.0)	437	76.3 (100.0)	2143	81.7 (100.0)
1. Yearly	835	74.8	359	60.9	255	58.3	1449	67.6
2. Less frequently than yearly	282	25.2	230	39.1	182	41.7	694	32.4

TABLE 8—Institutions with Faculty Development Programs, By Program Characteristics

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
Institutions with a formal program:	911	69.5 (100.0)	486	65.7 (100.0)	334	58.4 (100.0)	1731	66.0 (100.0)
1. Workshops or symposia	884	97.0	424	87.3	271	81.2	1580	91.2
2. Teaching-improvement programs	593	65.1	277	57.1	240	71.8	1110	64.1
3. Individualized approaches	654	71.8	369	75.9	254	75.9	1277	73.7
4. A separate budget	549	60.3	357	73.5	246	73.7	1153	66.6
5. A coordinator/coordinating committee	527	57.9	288	59.3	230	68.8	1046	60.4
6. Released time to develop new course material	501	54.9	252	51.9	203	60.8	956	55.2

TABLE 9—Selected Policies of Institutions Offering College Tuition Payment Plans and Aid, *All Institutions*

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
Institutions that offer:								
1. Merit scholarships	325	24.8	228	30.8	245	42.7	797	30.4
2. Own loan programs for parents/students	395	30.1	229	31.1	240	42.0	865	33.0
3. Differential tuition rates	38	2.9	92	12.5	48	8.4	179	6.8
4. An extended payment plan for tuition & fee	419	32.0	469	63.5	268	46.9	1157	44.1

TABLE 10—Administrators' Views of Changes During the Last Five Years, *All Institutions*

	Two-year Colleges		Baccalaureates		Universities		All Institutions	
	1311	%	739	%	573	%	2623	%
1. Relationship with state agencies, Better	606	46.2	306	41.5	274	47.8	1187	45.2
Same	639	48.8	432	58.5	277	48.3	1349	51.4
Worse	65	5.0	0	0.0	22	3.8	87	3.3
2. Relationship with federal agencies, Better	297	22.6	185	25.0	163	28.4	644	24.5
Same	942	71.9	494	66.9	398	69.4	1834	69.9
Worse	72	5.5	60	8.2	12	2.2	145	5.5
3. Ability to attract good students, Better	687	52.4	453	61.3	353	61.6	1493	56.9
Same	509	38.8	235	31.8	193	33.7	937	35.7
Worse	115	8.8	51	6.9	27	4.7	193	7.3
4. Ability to attract good faculty, Better	467	35.6	386	52.2	274	47.8	1126	42.9
Same	765	58.3	316	42.7	255	44.5	1336	50.9
Worse	80	6.1	37	5.1	44	7.7	161	6.1
5. General preparation level, Better	293	22.4	242	32.8	224	39.1	759	28.9
Same	751	57.3	356	48.2	292	51.0	1399	53.4
Worse	269	20.5	141	19.1	59	10.3	469	17.9
6. Job prospects for grads, Better	547	41.7	276	37.4	233	40.7	1057	40.3
Same	600	45.7	370	50.1	313	54.6	1283	48.9
Worse	162	12.4	92	12.5	24	4.3	279	10.6
7. Overall faculty morale, Better	511	39.0	367	49.7	228	39.8	1106	42.2
Same	589	45.0	321	43.5	268	46.9	1179	45.0
Worse	211	16.1	50	6.8	77	13.4	337	12.9
8. Overall faculty productivity, Better	360	27.5	301	40.7	345	60.3	1006	38.4
Same	885	67.5	414	56.0	219	38.3	1518	57.9
Worse	66	5.1	24	3.3	8	1.4	98	3.8
9. Adequacy of faculty compensation, Better	530	40.4	336	45.5	275	48.1	1141	43.5
Same	539	41.1	254	34.3	201	35.2	994	37.9
Worse	242	18.5	149	20.2	98	17.2	490	18.7
10. Adequacy of student aid, Better	524	39.9	324	43.8	257	44.8	1104	42.1
Same	661	50.4	299	40.5	229	39.9	1188	45.3
Worse	127	9.7	116	15.8	91	15.8	334	12.7
11. Adequacy of equipment, Better	589	44.9	333	45.1	221	38.6	1144	43.6
Same	504	38.4	296	40.1	213	37.3	1013	38.6
Worse	218	16.7	122	16.5	132	23.1	473	18.0
12. Adequacy of library resources, Better	495	37.7	342	46.2	247	43.1	1083	41.3
Same	620	47.3	286	38.7	234	40.8	1140	43.5
Worse	197	15.0	105	14.2	92	16.1	394	15.0
13. Adequacy of physical plant, Better	705	53.7	499	67.6	309	54.0	1513	57.7
Same	396	30.2	179	24.2	208	36.3	783	29.9
Worse	210	16.0	55	7.4	56	9.7	320	12.2

APPENDIX A: SURVEY INSTRUMENT

AMERICAN COUNCIL ON EDUCATION
Higher Education Panel

June 26, 1984

Dear Higher Education Panel Representative,

Attached is Higher Education Panel Survey No. 65, a survey sponsored by the American Council on Education to obtain general information on campus trends in a number of different areas. The questionnaire was designed to elicit a snapshot view of recent or pending changes in a variety of institutional policies and practices affecting, among other things, course offerings, faculty, and admissions and graduation requirements.

You will note that this questionnaire does not seek numerical responses. Rather, it asks a series of general questions and in many instances seeks opinions and judgments about change. For this reason, we suggest that the survey be completed by a high-level administrative official with a broad view of the institution, preferably the academic vice president. As usual, however, we leave that decision to you.

Please understand that your institution's responses will be held in strict confidence. As with all our surveys, the data you provide will be reported in summary fashion only and will not be identified with your institution.

Please have the completed questionnaire returned to us by July 13, 1984. A preaddressed envelope is enclosed for your convenience. If you have any questions or problems, please do not hesitate to telephone us collect at 202/833-4757.

Sincerely,

Frank J. Atelsek

Frank J. Atelsek
Panel Director

Attachment

One Dupont Circle, Washington, D.C. 20036-1193 (202) 833-4757

AMERICAN
COUNCIL ON
EDUCATION

Higher Education Panel Survey Number 65

CAMPUS TRENDS 1983–84

You will note that this questionnaire does not seek numerical responses; rather, it asks a series of general questions about policies and practices at your institution and seeks your opinions and judgments about change.

Please answer the following questions for academic year 1983–84.

I. COURSE OFFERINGS

A. Does your institution offer credit or noncredit courses open to all students on:

	Yes	No
1. Improving writing skills	☐	☐
2. Improving problem-solving or critical-thinking skills	☐	☐
3. Career planning	☐	☐
4. Coping with college (study skills, expectations, etc.)	☐	☐
5. Using personal computers	☐	☐

B. Does your institution offer:

	Yes	No
1. An External Degree program	☐	☐
2. A Weekend College program (for degree study)	☐	☐
3. Honors courses, sections or programs	☐	☐
4. Special program(s) focusing on student retention	☐	☐
5. Academic credit for remedial/developmental courses	☐	☐

C. Are undergraduate courses offered in the following areas?

	Yes, and as a major	Yes, but not as a major	No
1. International studies	☐	☐	☐
2. National security issues	☐	☐	☐
3. Soviet (or Russian) studies	☐	☐	☐
4. Women's studies	☐	☐	☐
5. Black studies	☐	☐	☐
6. Hispanic studies	☐	☐	☐
7. Asian/Pacific-American studies	☐	☐	☐

D. Does your institution have an undergraduate teacher training program?

☐ No
☐ Yes

If "yes:"

1. Does it include:

	Yes	Under Discussion	No
a. Minimum requirements for entrance into the program	☐	☐	☐
b. Special recruitment efforts to attract the best students to teacher training	☐	☐	☐
c. Tighter standards now than a few years ago	☐	☐	☐
d. A required major/minor in a discipline (other than education) for students in secondary education	☐	☐	☐
e. A fifth year of study	☐	☐	☐

2. Is your institution now considering the abolition of its undergraduate teacher training program?

☐ No
☐ Yes

E. Is a general review of curriculum under way or has one recently been completed?

☐ No
☐ Yes, currently under way (or ongoing)
☐ Yes, completed within the last five years

If "yes," does it address:

	Yes	No
1. New general education requirements	☐	☐
2. Greater emphasis on competencies and skills	☐	☐
3. An increase in course requirements	☐	☐
4. Greater flexibility for adult learners	☐	☐
5. New attention to foreign language study	☐	☐
6. Greater attention to career preparation	☐	☐

II. COLLEGE COSTS—Does your institution offer:

	Yes	No
1. Merit scholarships covering full tuition, room and board	☐	☐
2. Its own loan program for parents or students	☐	☐
3. Differential tuition rates for different undergraduate fields of study	☐	☐
4. An extended payment plan for tuition and fee payments	☐	☐

III. ADMISSIONS AND GRADUATION REQUIREMENTS

A. Is a review of admissions requirements currently under way or has one recently been completed?

☐ No
☐ Yes, currently under way (or ongoing)
☐ Yes, completed within the last five years

If "yes," does it address:

	Yes	No
1. Raising admissions requirements	☐	☐
2. Specifying courses required for admissions	☐	☐
3. Special procedures for adults and older students	☐	☐
4. Reviewing the role of standardized test scores in the admissions process	☐	☐

B. Which of the following are required (for undergraduates)?

	Required for all students	Required for some students	Not required
1. Entering students must take placement tests or otherwise meet requirements in:			
a. Mathematics	☐	☐	☐
b. English skills	☐	☐	☐
2. Foreign language study is required for:			
a. Admissions	☐	☐	☐
b Graduation	☐	☐	☐
3. Students must complete a core amount of coursework in general education	☐	☐	☐
4. Students must take comprehensive exams to complete a major	☐	☐	☐
5. Students must meet institution-wide writing requirements before graduation	☐	☐	☐
6. Students must meet other proficiency requirements before graduation	☐	☐	☐

IV. FACULTY

A. Were any new full-time faculty hired in 1983–84?

☐ No
☐ Yes

If "yes," did this include:

	Yes	No
1. New women faculty	☐	☐
2. New Black or Hispanic faculty	☐	☐

B. Compared with a year earlier, do you estimate there was:

☐ A net loss in faculty positions
☐ A net gain in faculty positions
☐ No change in faculty positions

C. Was extensive use made of part-time faculty (i.e., for more than about one-fourth of courses)?

☐ No
☐ Yes

D. Does your institution have a formal faculty development program?

☐ No
☐ Yes

If "yes," does it include:

	Yes	No
1. Workshops or symposia	☐	☐
2. Teaching-improvement programs	☐	☐
3. Individualized approaches (assistance as needed or requested)	☐	☐
4. A separate budget	☐	☐
5. A coordinator or coordinating committee	☐	☐
6. Released time for faculty to develop new course material	☐	☐

E. Are tenured or senior faculty evaluated periodically?

☐ No
☐ Yes

If "yes," does this occur:

☐ Yearly
☐ Less frequently than yearly

F. Did any full-time faculty take early retirement (nondisability retirement earlier than your institutional norm) during 1983–84?

☐ No
☐ Yes

SEE BACK PAGE

V. OPINIONS OF CHANGE—Compared with five years ago, how would you rate the following:

	Better	About the same	Worse
1. Your institution's relationships with state agencies	☐	☐	☐
2. Your institution's relationships with federal agencies	☐	☐	☐
3. Ability of your institution to attract good students	☐	☐	☐
4. Ability of your institution to attract and hold good faculty	☐	☐	☐
5. General level of preparation of your institution's entering students	☐	☐	☐
6. Job prospects for this year's baccalaureate or associate degree recipients from your institution	☐	☐	☐
7. Overall level of faculty morale at your institution	☐	☐	☐
8. Overall level of faculty productivity at your institution in research, teaching, or public service	☐	☐	☐
9. Adequacy of faculty compensation at your institution	☐	☐	☐
10. Adequacy of student aid provided by your institution, including scholarships, fellowships, and loans	☐	☐	☐
11. Adequacy of equipment for teaching and research at your institution	☐	☐	☐
12. Adequacy of library resources at your institution	☐	☐	☐
13. Adequacy of your institution's physical plant and overall campus appearance	☐	☐	☐

VI. BUSINESS AND INDUSTRY—Does your institution have formal ties with business or industry in any of the following areas:

	Yes	Under Discussion	No
1. Shared or on-loan staff	☐	☐	☐
2. Research	☐	☐	☐
3. Equipment (donations, loans, or shared use)	☐	☐	☐
4. Scholarship or loan programs	☐	☐	☐
5. Joint meetings or advisory panels	☐	☐	☐
6. Credit courses for business employees at business locations	☐	☐	☐
7. Noncredit courses for business employees at business locations	☐	☐	☐
8. Jointly developed and sponsored degree program(s)	☐	☐	☐

Thank you for your cooperation.

Please return this form by **July 13, 1984**, to:

Higher Education Panel
American Council on Education
One Dupont Circle, Suite 829
Washington, D.C. 20036

Please keep a copy of this survey for your records.

Name of Respondent ____________________

Department ____________________

Telephone ____________________

If you have any questions or problems concerning this survey, please call the HEP staff collect at (202) 833-4757.

APPENDIX B: TECHNICAL NOTES

Data from the responding Panel institutions were statistically adjusted to represent all of the nation's colleges and universities except specialized and religious institutions. The stratification design for weighting follows.

The weighting technique used was the standard one employed for Panel surveys. Data received from Panel members were adjusted for item and institutional nonresponse within each cell. Then institutional weights were applied to bring the Panel data up to estimates representative of the national population.

Table B-2 compares survey respondents and nonrespondents against several variables. Higher-than-average response rates were recorded for private baccalaureate and private two-year institutions. Large doctorate-granting universities had lower-than-average response rates.

TABLE B–1:—Stratification Design

Cell	Type of Institution	Enrollment	Population	Respondents
	Total		2,624	413
1	Large public doctorate-granting	a	104	44
2	Large private doctorate-granting	a	61	23
3	Large public comprehensive	a	92	41
4	Large private comprehensive	a	27	13
7	Large public two-year	a	43	20
8	Public comprehensive	5,500–8,999	56	14
9	Public comprehensive	<5,500	108	20
10	Private comprehensive	<9,000	126	22
11	Public baccalaureate	<9,000	127	20
12	Private baccalaureate	1,350–8,999	166	25
13	Private baccalaureate	<1,350	446	37
17	Public two-year academic/comprehensive	6,000–8,999	55	16
18	Public two-year academic/comprehensive	4,000–5,999	72	16
19	Public two-year academic/comprehensive	2,000–3,999	155	24
20	Public two-year academic/comprehensive	<2,000	333	23
21	Private two-year academic/comprehensive	<9,000	129	12
22	Public two-year occupational	2,500–8,999	63	14
23	Public two-year occupational	<2,500	221	18
24	Private two-year occupational	<9,000	240	11

[a] Institutions that meet one or more of the three following criteria: (a) total full-time equivalent (FTE) 1981 enrollment greater than 8,999; (b) FTE 1981 graduate enrollment greater than 749; (c) FY 1979 educational and general expenditures of $35 million or more.

TABLE B–2:—Comparison of Respondents and Nonrespondents

(In percentages)

Control and Type of Institution	Respondents (N = 413)	Nonrespondents (N = 45)	Response Rate
Total	100.0	100.0	90.2
Control			
Public	65.4	73.3	89.1
Private	34.6	26.7	92.3
Type and control			
Large public doctorate-granting	10.7	17.8	84.6
Large private doctorate-granting	5.6	15.6	76.7
Public comprehensive	18.2	24.4	87.2
Private comprehensive	8.5	4.4	94.6
Public baccalaureate	4.8	4.4	90.9
Private baccalaureate	15.0	4.4	96.9
Public two-year	31.6	26.8	91.6
Private two-year	5.6	2.2	95.8

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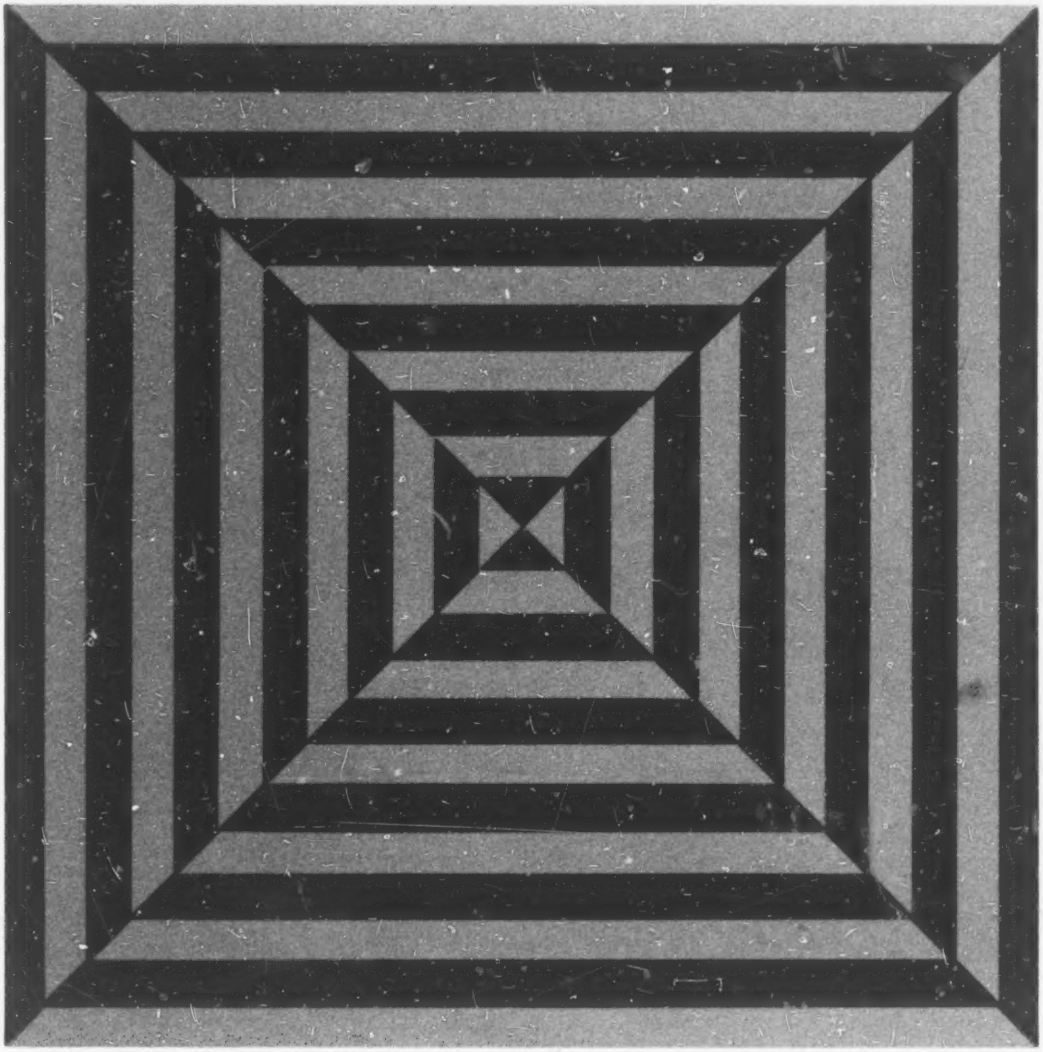
GENERAL EDUCATION REQUIREMENTS IN THE HUMANITIES

Nancy Suniewick
Elaine El-Khawas



HIGHER EDUCATION PANEL REPORT NUMBER 66
AMERICAN COUNCIL ON EDUCATION

OCTOBER
1985

A Survey Funded by the National Science Foundation, the U.S. Department of Education, and the National Endowment for the Humanities

AMERICAN COUNCIL ON EDUCATION

Robert H. Atwell, President

The American Council on Education, founded in 1918, is a council of educational organizations and institutions. Its purpose is to advance education and educational methods through comprehensive voluntary and cooperative action on the part of American educational associations, organizations, and institutions.

The Higher Education Panel is a survey research program established by the Council for the purpose of securing policy-related information quickly from representative samples of colleges and universities. *Higher Education Panel Reports* are designed to expedite communication of the Panel's survey findings to policy makers in government, in the associations, and in educational institutions across the nation.

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General Education Requirements in the Humanities

Nancy Suniewick
Elaine El-Khawas

Higher Education Panel Reports
Number 66 October 1985

American Council on Education
Washington, D.C. 20036

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Special appreciation is extended to the campus representatives for the Higher Education Panel. We are grateful for their participation in the survey and their continuing cooperation in our efforts to gather information on important trends affecting higher education.

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HIGHLIGHTS

Results of a spring 1984 survey offer the following information about the nature of general education requirements at American colleges and universities.

- Almost all collegiate institutions in the U. S. required that some general education courses be taken by all of their degree candidates. On average, 45 (semester) hours of general education were required in four-year programs and 29 hours of general education were required in two-year degree programs.

- In most institutions, students had to meet these general education requirements by choosing from a limited range of courses designated by the college. Compared to five years ago, fewer colleges offered students an unlimited range of choices, and significantly more required that students choose from a limited range of courses.

- English composition was clearly a core subject, required for all degree candidates by about 9 in 10 institutions. No other humanities subject area reached such a level of broad consensus across institutions.

- Baccalaureate colleges were distinctive in showing a stronger pattern of humanities requirements than were other institutions. In addition to requirements in English composition, about half of baccalaureate colleges required all students to take courses in English or American literature, in world civilization, and in philosophy.

- Relatively few American colleges and universities required that all of their degree students take courses covering such traditional topics as ancient or medieval European history, the literature and philosophy of ancient Greece and Rome, or European history since the Renaissance. Rare too were any institution-wide requirements for courses on the literature, history, or cultures of Africa or Asia.

- About two-thirds of institutions relied on textbooks and other secondary sources in their humanities courses that were part of general education requirements. Such practices were more prevalent among public than among private institutions. At least half of institutions, and particularly private institutions, required students in such courses to read selections from primary texts. About 4 in 10 institutions required that primary texts be read in their entirety. Again, such practice was more prevalent among private than public institutions.

- Almost half of four-year institutions had foreign language requirements for all undergraduates. Private institutions had such institution-wide requirements more often than public institutions.

- Although there were some differences by control and type of institutions, the predominant approach to the teaching of expository writing at four-year institutions involved a special composition program for undergraduates. About half of institutions had a writing laboratory. About 4 in 10 institutions had a "writing across the curriculum" program. At two-year institutions, the predominant approach was to offer expository writing only through the English department.

- At the time of the survey, about half of the nation's colleges and universities were engaged in a process of restructuring their general education requirements.

BACKGROUND

In the spring of 1984, the National Endowment for the Humanities asked the Higher Education Panel to undertake a survey of general education requirements in the humanities. The purpose of the survey was to determine the status of the humanities in the undergraduate curricula of the nation's colleges and universities. Results of the survey would aid the Endowment in designing grant programs to strengthen undergraduate teaching and learning in the humanities.

METHODS SUMMARY

The Higher Education Panel forms the basis of a continuing survey research program created in 1971 by the American Council on Education. Its purpose is to conduct surveys on topics of current policy interest to the higher education community and to government agencies.

The Panel is a disproportionate stratified sample of 1,040 higher education institutions (divided into two half-samples of 520 institutions each) drawn from the population of more than 3,200 colleges and universities listed in the National Center for Education Statistics' *Education Directory, Colleges and Universities*. All institutions in the population are grouped according to the Panel's stratification design, which is based on institution type (doctorate-granting, comprehensive, baccalaureate, specialized, and two-year academic or occupational), control (public, private), and size (full-time-equivalent enrollment). For any given survey, either one of the half-samples, or an appropriate subgroup of the full Panel is used.

The survey operation depends on a network of campus representatives at the Panel institutions whose presidents have agreed to participate. The representatives receive the Panel questionnaires and direct them to the most appropriate campus officials for response.

The survey sample for this study consisted of the two-year colleges, four-year colleges, and universities in one half-sample. Excluded were institutions offering only graduate degrees and such specialized institutions as religious schools, schools of medicine, allied health services, business, and law, and four-year schools of the studio and performing arts.

A field test of the survey instrument was conducted in April 1984. The final version of the survey was mailed in two stages to avoid overlap with a previous survey. The first mailing occurred July 11, 1984; the second was sent July 25. A series of mail and telephone follow-ups to nonrespondents, supplemented by information from institutional catalogues, resulted in usable responses from 374 of the 454 eligible institutions surveyed, for an 84 percent response rate.

Data from the responding institutions were statistically weighted so that the results reflect the national population of 2,566 colleges and universities offering four-year and two-year degrees. (Institutional weights are based on the ratio of respondents to the number of institutions in the eligible population, separately for each stratum).

Appendix A includes a facsimile of the survey. Appendix B includes a description of the stratification design used to produce the national estimates, a comparison of respondents and nonrespondents according to various institutional characteristics, and an explanation of the reliability of the survey estimates.

FINDINGS

Overview

This report offers a detailed look at the extent to which American colleges and universities have general education requirements in the humanities.[1] This involves coursework that each institution has deemed to cover the "core" subjects that all undergraduate students should learn, regardless of their major. Survey results suggest that, overall, the humanities had a limited role in such requirements beyond the English composition courses that almost all institutions required.

The report describes the pattern of institutional requirements in several other areas, including foreign language proficiency, skills in library research, and expository writing. It also documents that a good many colleges and universities were reexamining and restructuring their general education requirements. The possible direction of such change is suggested by other information on changes in policy over the last five years, including evidence of increased credit-hour requirements in certain subjects and some movement away from allowing a wide range of choices for meeting general education requirements.

The report describes practices affecting four-year programs offered by doctoral, comprehensive, and baccalaureate institutions. A separate section describes general education requirements at two-year institutions. Comparisons between public and private institutions are made on most topics.

Readers should note that this survey focuses only on those institution-wide requirements that apply to *all* degree candidates. At a four-year institution, such requirements would affect students enrolled in schools of education, business, engineering, and other specializations as well as students enrolled in a school of liberal arts. At a two-year college, these requirements would be applicable to students enrolled both in associate of arts and associate of science degree programs. As will be seen, doctoral and comprehensive institutions had relatively few institution-wide requirements in the humanities. Baccalaureate colleges, in contrast, were more likely to have general requirements in humanities subjects for all of their students.

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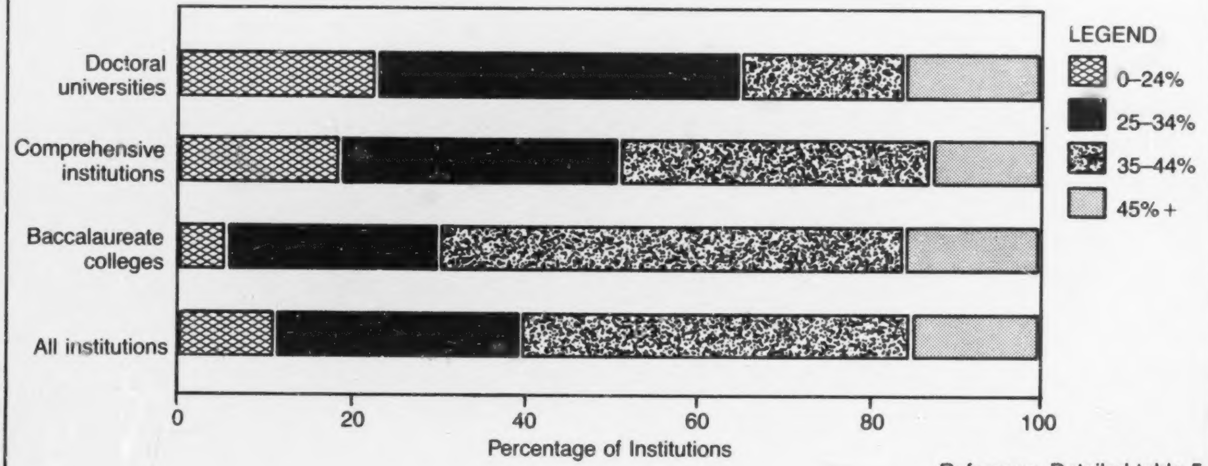
[1] For the purpose of this survey, general education is defined as the part of the curriculum that all undergraduates are required to take, regardless of major, in order to graduate. It generally includes study in the humanities (e.g., English, literature, foreign language, history, philosophy, and other disciplines) and in other liberal arts subjects (e.g., social sciences, mathematics, and natural and physical sciences).

FIGURE 1

Hours of General Education as a Percentage of Total Graduation Hours, Four-year institutions 1984–85



Reference: Detailed table 5

General Education Requirements at Four-year Institutions

In 1984–85, almost all of the four-year institutions in the U. S. (96 percent) required *all* degree candidates to take some general education courses to graduate. On average, a minimum of 45 semester hours of general education were required out of a total of 125 hours needed for graduation[2] (see detailed table 4).[3] Thus, about a third of the total graduation credits involved general education.

These averages mask some important institutional differences, however. As figure 1 shows, a substantial percentage of doctoral universities required that one-quarter or less of a student's total credit hours be in general education. In contrast, most baccalaureate colleges mandated that one-third or more of a student's total credit hours be taken in general education.

Some modest increases can be noted between 1979–80 and 1984–85 in the average hours required in general education (see detailed table 4). The net result was that slightly more hours of general education were required in 1984–85 in relation to total graduation hours.

To fulfill their general education requirements in 1984–85, most students had to choose from a limited range of general education courses. Almost 9 out of 10 institutions followed this approach (see table A), and usually they specified departmental-level courses (e.g., history 101) that could be selected. In contrast, a minority of colleges and universities allowed students to fulfill requirements from an unlimited range of courses or through interdisciplinary or interdepartmental courses.

In fact, there has been some movement away from allowing students unlimited choice in fulfilling general education requirements. Compared to 1979–80, a higher percentage of institutions now specify a limited range of courses that meet general education requirements.

Requirements in the Humanities. The survey also requested information on the minimum number of credit hours required in twelve academic areas, including humanities and other subjects. As expected, requirements varied widely. Among the humanities, only English composition emerged as a core subject, and was required for all degree candidates by about 9 in 10 institutions. No other humanities subject came near this level of use (see figure 2). The picture that emerges is one of relatively little uniformity across institutions on the humanities subject areas that all students must cover in order to graduate.

Among the non-humanities subjects, social sciences were required by over 7 in 10 institutions, natural and physical sciences by 6 in 10, and mathematics by at least one-half (see figure 3 and detailed table 8). In addition, another 2 in 10 indicated that they may require coursework either in natural and physical sciences or in mathematics. Since detailed information was not requested, it is not possible to determine the degree of uniformity in coursework requirements outside the humanities.

There was more uniformity in general education requirements in baccalaureate colleges than in doctoral or comprehensive universities. In a departure from the overall pattern, a majority of baccalaureate colleges required that all of their students complete coursework in English or American literature, world civilization, other humanities, and mathematics. Three in 10 baccalaureate colleges also had general requirements in the arts. These requirements were in addition to required coursework in English composition, social science, natural and physical science, and mathematics. Further, among private baccalaureate

TABLE A—Type of General Education Requirements, 1984–85 and 1979–80
(Percentage of Institutions)

	Doctorate (N = 163)		Comprehensive (N = 399)		Baccalaureate (N = 708)	
	1984–85	1979–80	1984–85	1979–80	1984–85	1979–80
Specified departmental courses	63	58	79	78	83	79
Specified interdisciplinary or interdepartmental courses	15	9	34	28	31	27
Limited range of courses	85	63	87	76	87	70
Virtually unlimited range of courses	22	37	15	19	13	22

Reference: Detailed table 2
Note: Respondents were asked to indicate *all* items that applied to their institution's general education requirements. Thus, the columns do not sum.

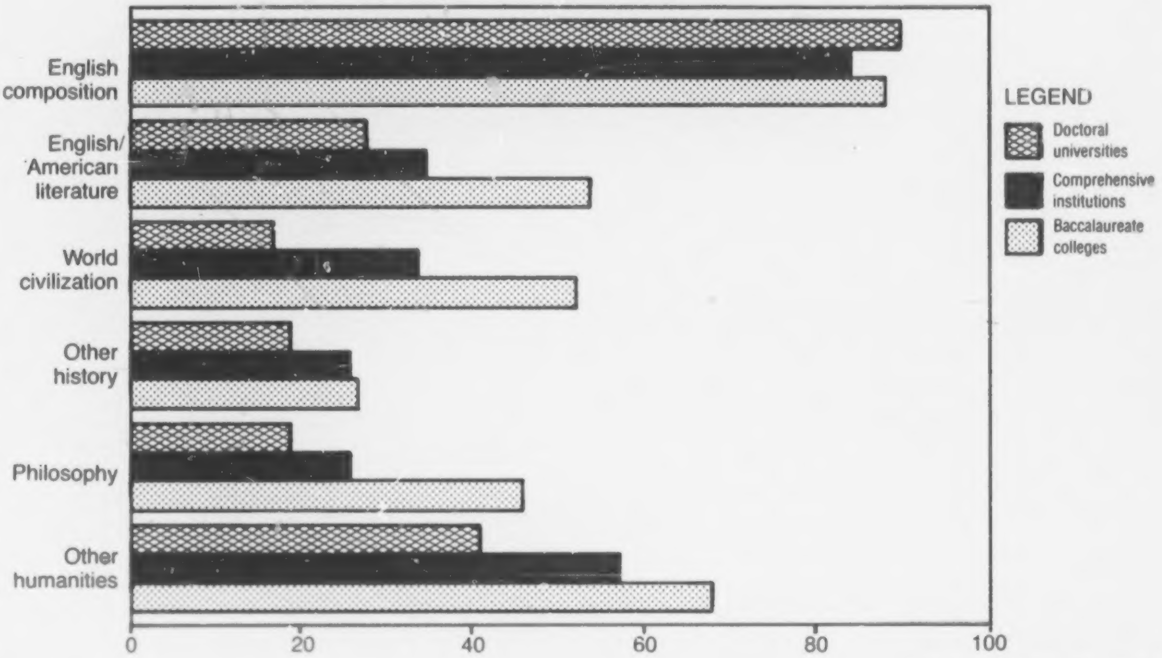
---

[2] All credit-hour data from institutions on the quarter system were converted to semester hours by the following formula: 1 quarter hour × ⅔ = 1 semester hour.

[3] Detailed tables are found in a separate section following the summary.

FIGURE 2

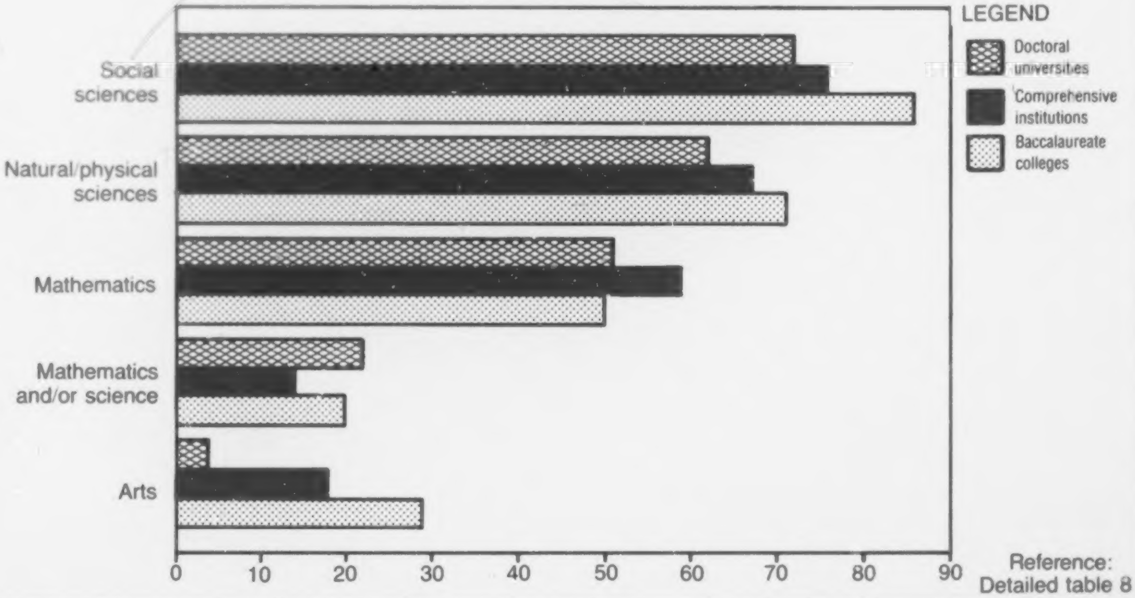
Percentage of Four-year Institutions Requiring Coursework in Selected Humanities Fields, 1984–85



Reference: Detailed table 8

FIGURE 3

Percentage of Four-year Institutions Requiring Coursework in Selected Nonhumanities Fields, 1984–85



Reference: Detailed table 8

TABLE B—Average Minimum Number of Credit Hours in Selected Humanities Fields, 1984–85

	Doctorate Institutions (N = 156)	Comprehensive Institutions (N = 366)	Baccalaureate Institutions (N = 694)
English composition	6	5	5
English/American literature	5	5	4
World civilization	6	6	4
Other history	4	5	4
Philosophy	4	5	4
Classics	0	1	3
Other humanities	8	7	9
Combination of humanities	10	11	13
Humanities and/or choice of other subjects	19	16	10

Reference: Detailed table 7

Note: Averages are based on responses of all institutions in each category, including those with no minimum requirements in a field. If the averages were based only on institutions *with* minimum requirements, these averages would be higher. In particular, these averages understate the minimum hours required in fields where only a small percentage of institutions have minimum requirements.

colleges, 54 percent mandated a minimum number of credit hours in philosophy and 4 in 10 mandated coursework in a foreign language.

The survey also offers evidence of a gradual movement toward subject-area requirements between 1979–80 and 1984–85. Although most differences are small, this trend appears in almost all subjects and for each type of institution. The most dramatic increases occurred among baccalaureate colleges, especially for world civilization (required by 52 percent, up from 33 percent) and mathematics (50 percent, up from 33 percent). Increases are also notable in English or American literature, philosophy, and foreign languages (see detailed tables 8 and 8.1).

TABLE C—Average Minimum Number of Credit Hours in Selected Nonhumanities Fields, 1984–85

	Doctorate Institutions (N = 156)	Comprehensive Institutions (N = 366)	Baccalaureate Institutions (N = 694)
Social Sciences	8	8	8
Natural and physical sciences	9	7	7
Mathematics	5	4	4
Mathematics and/or science[1]	8	11	10

Reference: Detailed table 7

Note: Averages are based on responses of all institutions in each category, including those with no minimum requirements in the field. If the averages were based only on institutions *with* minimum requirements, these averages would be higher. In particular, these averages understate the minimum hours required in fields where only a small percentage of institutions have minimum requirements.

Further perspective on these course requirements can be gained by examining differences in the minimum number of credit hours required in each of these subject areas (see table B). For English composition, the minimum was an average of 6 credit hours at doctoral institutions, and 5 credit hours each at comprehensive institutions and baccalaureate colleges. The least number of hours required was in the classics.

The minimum average number of credit hours for non-humanities subjects ranged from 4 hours of mathematics in baccalaureate colleges to 9 hours of natural and physical sciences in doctorate institutions (see table C).

Data were analyzed on institutions reporting increases between 1979–80 and 1984–85 in the minimum credit hours required in selected fields. Several fields showed significant activity, especially mathematics and world civilization (see table D). Most institutions reported no change.

Respondents were also asked if all students, in order to graduate, were required to take one or more courses that included substantial content in five specific subjects. These included: ancient or medieval European history; European history since the Renaissance; American history and literature; literature and philosophy of ancient Greece and Rome; and literature, history, or cultures of Africa or Asia.

As can be seen (table E), relatively few institutions reported such specific requirements. Once again, baccalaureate institutions formed the main exceptions to this pattern. Among baccalaureate colleges, 31 percent required courses in European history since the

TABLE D—Institutions Reporting Increases Between 1979–80 and 1984–85 in the Minimum Credit Hours Required in Selected Fields

(Percentage of Institutions)

	Doctorate Institutions (N = 163)	Comprehensive Institutions (N = 399)	Baccalaureate Institutions (N = 708
Mathematics	19	15	17
World civilization	3	11	21
Social Sciences	12	10	14
English/American literature	4	5	16
Natural and physical sciences	10	8	10
English composition	10	11	5
Philosophy	3	4	10

Reference: Detailed table 6

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[1] Some institutions collapsed categories, reporting the number of credit hours for both mathematics and/or natural and physical sciences.

TABLE E—Percentage of Four-year Institutions with Course Requirements Covering Specific Content Areas

	Doctorate Institutions (N = 163)	Comprehensive Institutions (N = 399)	Baccalaureate Institutions (N = 708)
American history and literature	19	35	26
European history since the Renaissance	11	19	31
Ancient or medieval European history	9	17	26
Literature and philosophy of ancient Greece and Rome	8	7	19
Literature, history, or cultures of Africa or Asia	14	7	8

Reference: Detailed table 9

Renaissance and almost as many required courses covering American history and literature, and ancient or medieval European history. Fully 35 percent of comprehensive institutions required coursework in American history and literature. In contrast, fewer than 1 in 10 institutions required all of their students to take courses dealing with the literature, history, or cultures of non-Western countries. Doctorate institutions required such courses slightly more frequently than did others.

The general pattern among American colleges and universities today, appears to be that few specific subjects are mandated for all students. This is especially evident at doctoral institutions, where individual departments or colleges typically set their own requirements for their students. Some ambiguity in questionnaire wording must also be acknowledged, however. Thus, for example, respondents might have answered the query about American history and American literature only in terms of a course that covered both aspects (see Appendix A). It is far more typical for colleges to offer history courses apart from literature coursework.

Foreign Language Requirements. About half the baccalaureate colleges and about 4 in 10 of comprehensive and doctoral institutions had foreign language requirements for all their undergraduate students (see table F). Among such institutions, 54 percent of the doctoral universities, 46 percent of the comprehensive institutions, and 41 percent of the baccalaureate colleges required that a specified number of foreign language courses or hours be taken. Very few institutions required that a language proficiency examination must be passed, and a number of institutions allowed substitutions to foreign language requirements. Such practice was most frequent in baccalaureate colleges where 58 percent allowed students to take computer courses instead of foreign languages.

A significantly greater proportion of private institutions had foreign language requirements, compared to public institutions. Over half the private doctoral universities and private baccalaureate colleges and 62 percent of private comprehensive universities required foreign language study of all degree candidates. In contrast, about 3 in 10 public institutions did so (see detailed table 10).

Other Requirements. Over half the baccalaureate colleges but only 3 in 10 comprehensive and 2 in 10 doctorate universities required *all* undergraduates to have formal training in the use of the college library for research. This typically involved an orientation conducted by library staff, rather than more intensive training conducted by faculty (see table G). Other forms of library training were cited by 20 percent of doctoral institutions and by 13 percent of other four-year institutions. These included self-tutorial programs undertaken through workbooks as well as specific courses on library research skills and work on

TABLE F—Percentage of Four-year Institutions with Foreign Language Requirements for All Undergraduates, 1984–85

	Doctorate Institutions (N = 163)	Comprehensive Institutions (N = 399)	Baccalaureate Institutions (N = 708)
Percentage requiring foreign language coursework	39%	41%	48%
Number of four-year institutions requiring foreign languages	(N = 63)	(N = 162)	(N = 341)
Specified courses	54%	46%	41%
Proficiency examinations	19	16	6
Substitutions, computer courses	16	27	58
Substitutions, other	35	25	22

Note: Multiple responses were permitted; therefore, detail will total to more than 100 percent. These figures were recalculated from data in detailed table 10.

TABLE G—Percentage of Four-year Institutions Requiring Library Training, 1984–85

	Doctorate Institutions (N = 163)	Comprehensive Institutions (N = 399)	Baccalaureate Institutions (N = 708)
Percentage requiring formal library training	22%	32%	56%
Number of institutions requiring formal library training	(N = 35)	(N = 128)	(N = 384)
Orientation by library staff	74%	81%	96%
Intensive training	14	45	46
Other	20	13	13

Reference: Detailed table 12

Note: Multiple responses were permitted; therefore, detail will total to more than 100 percent. These figures were recalculated from data in detailed table 12.

library skills that was included as part of an English composition course or a literature course.

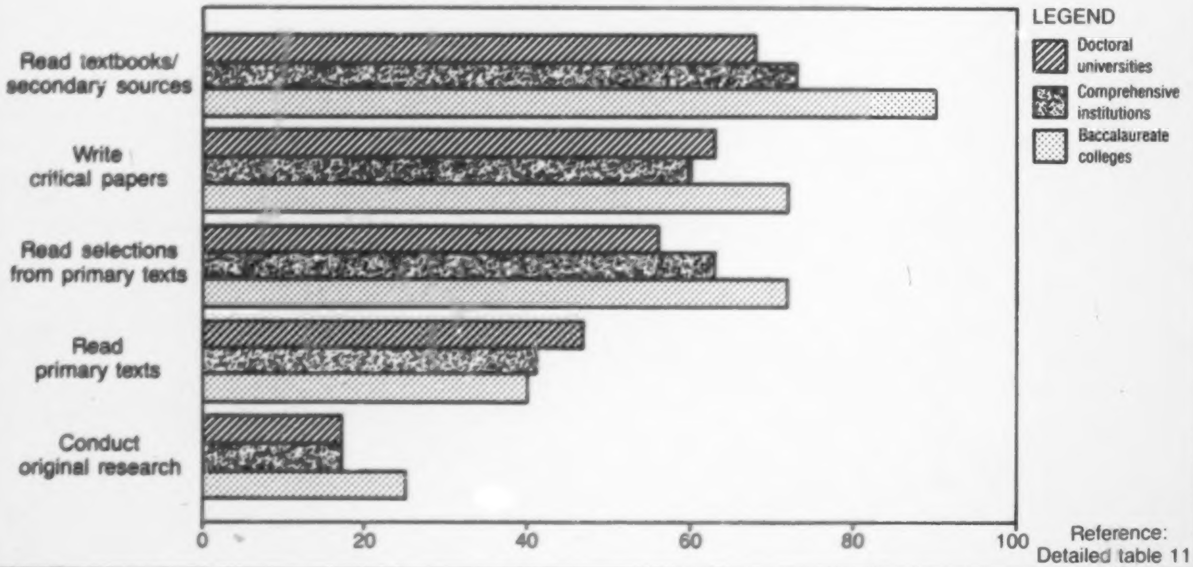
Instructional Approaches. Respondents were asked about the instructional approaches they employed in general education courses in the humanities. These methods included the use of primary literary, historical, or critical texts (in their entirety or as selections); the use of textbooks and other secondary sources; the writing of critical papers; and conduct of original research from primary sources.

Reading textbooks and other secondary sources was the most prevalent method of teaching humanities in four-year institutions: 90 percent of baccalaureate colleges, 73 percent of comprehensive universities, and 68 percent of doctoral institutions employed this method in at least one-third of the humanities courses their students take to fulfill general education requirements (see figure 4 and detailed table 11). Other popular methods included reading selections from primary literary, historical, or critical texts and writing critical papers. Only about 4 in 10 institutions required that students in humanities courses read summary texts in their entirety, and fewer than 2 in 10 required their students to conduct original research from primary sources.

Public and private institutions differed somewhat in the instructional approaches employed to teaching of humanities courses. Private institutions were more likely than were public institutions to require students to read primary texts in their entirety or use selections from such sources, to write critical papers, and to conduct original research from primary

FIGURE 4

Percentage of Institutions Using Various Teaching Methods in At Least One-third of General Education Courses in the Humanities



Reference: Detailed table 11

TABLE H—Approaches to Teaching Expository Writing, 1984–85
(Percentage of Institutions)

Type of Approach	Doctorate Institutions (N=163)	Comprehensive Institutions (N=399)	Baccalaureate Institutions (N=708)
Writing is taught only in the English department	42	46	47
Writing is taught in a special composition program	68	72	57
Writing is taught in a writing laboratory	61	66	49
Writing is taught using a peer tutorial system	22	41	31
Writing is taught in a "writing across-the-curriculum" program, i.e., in all or most academic departments	36	43	43
Students are responsible for a designated amount of critical writing in the general education courses	47	35	44
Students must pass a writing proficiency examination	28	34	25
Students *may* write a senior thesis	68	48	52
Students *must* write a senior thesis	3	1	10

Reference: Detailed table 13

sources. Public institutions were more likely than were private ones to rely on textbooks and other secondary sources.

Baccalaureate colleges were somewhat different in this aspect. First, they relied more frequently than did other institutions on the use of textbooks and secondary sources, on selections from primary texts, on writing critical papers, and on conducting original research—even though this was required by only one-fourth of baccalaureate colleges. Only 4 in 10 baccalaureate colleges required that their students read primary texts, and this practice was more prevalent among public than among private baccalaureate colleges. This contrasts with the practice at other types of institutions where the private more frequently than the public required students to read primary texts.

Respondents were given nine different modes by which to characterize their institution's approach to expository writing (see table H). More than one approach could be indicated. The most prevalent approach, cited by almost two-thirds of all four-year institutions, was the use of a special composition program for undergraduates. Writing is taught in writing laboratories at over half of the institutions. About 4 in 10 institutions required "writing across the curriculum" and a similar proportion included critical writing in their general education courses. A senior thesis was rarely required, and relatively few institutions required a writing proficiency examination.

Approaches to teaching expository writing skills differed somewhat by type of four-year institutions. For instance, the use of special composition programs and writing laboratories was more prevalent in doctorate and comprehensive universities than in baccalaureate colleges (see detailed table 13). There were also some differences by control of institutions. In general, public four-year institutions were more likely than were private ones to rely on writing laboratories, while private institutions were more likely to teach writing skills in all or most academic departments (i.e., "writing across the curriculum").

Restructuring of General Education Requirements. At the time of the survey, between 50 and 60 percent of the four-year institutions were either en-

TABLE I—Percentage of Four-year Institutions Reporting Restructuring of General Education Requirements and Principal Initiators

	Doctorate Institutions (N=163)	Comprehensive Institutions (N=399)	Baccalaureate Institutions (N=708)
Percentage of institutions reporting restructuring of requirements	57%	57%	51%
Number of institutions reporting such restructuring	(N=102)	(N=219)	(N=361)
Percentage of these institutions reporting restructing initiated by			
Faculty committee/senate	35%	56%	39%
Dean/president	35	38	51
Other	30	7	10

Reference: Detailed table 14.1

gaged in some stage of restructuring or had just completed restructuring their general education requirements. Of these, about half were in the planning stages regarding such changes; relatively few had completed the process (see table I and detailed table 14).

Slightly more doctoral universities were engaged in such a restructuring process than comprehensive institutions or baccalaureate colleges. Further, public institutions were more likely than were private institutions to report that they were either considering such change or had already restructured their general education requirements.

Between one-third and one-half of institutions cited faculty groups (faculty committees or the faculty senate) as the principal "initiators" in the restructuring of general education requirements. Senior administrators (typically a dean or, less often, a president) were often cited as the initiator of this change, particularly in baccalaureate colleges. Other factors cited as principal initiators were state agency directives or state legislature guidelines, particularly at doctoral universities (see table I).

General Education Requirements at Two-year Colleges[4]

Most two-year colleges (89 percent) had general education requirements for all of their degree candidates. Typically, this involved an average of 26 credit hours of coursework out of an average of 65 hours required for completion of a two-year degree (see table J and detailed table 4.1). There was no appreciable change over the last five years in the proportion of total hours that were devoted to general education.

As was the case with four-year institutions, the great majority of two-year colleges (81 percent) required their students to choose from a limited range of courses in meeting general education requirements. Eighty-nine percent of two-year colleges reported that all degree candidates must take humanities courses that were specified along departmental lines (e.g., history 101). As with four-year institutions, two-year colleges showed some movement away from allowing students an unlimited range of choices (see detailed table 2).

With respect to specific subject areas, two-year colleges also reflected the general tendency, noted earlier with four-year institutions, to require English composition courses. In 1984–85, 90 percent of two-year colleges did so. In contrast, relatively few two-year colleges specified that students must take coursework in English or American literature (23 percent), world civilization (13 percent), or other humanities subjects. Over 7 in 10 two year colleges also required studies in social sciences, while 6 in 10 required studies in mathematics and natural and physical sciences (see table K and detailed table 8).

Notably, a number of two-year colleges increased their humanities requirements during the last five years. As figure 5 shows, 12 percent of two-year colleges reported increases in English and 17 percent reported increases in other humanities subjects (which may have included linguistics, art history,

TABLE J—Hours Required for General Education Courses and for Graduation: Two-year Programs

Type of Institution and Requirement	1984–85	1979–80
	(In Credit Hours)	
All institutions with two-year programs		
Average hours of general education	29	28
Average hours for graduation	64	64
Two-year colleges		
Average hours of general education	26	26
Average hours for graduation	65	66

Reference: Detailed table 4.1

TABLE K—Selected Characteristics of General Education Requirements at Two-year Colleges

Characteristics	Percentage of Two-year Colleges
Institutions with general education requirements	89
Approaches to teaching expository writing (fall 1984)	
English department only	57
Composition program	50
Writing laboratory	48
Peer tutorial	21
Across-the-curriculum	34
Designated amount of critical writing	44
Proficiency examination	25

Required coursework in selected fields, 1984–85	1984–85	1979–80
	(In Percentages)	
English composition	90	84
English/American literature	23	20
Foreign language	5	5
World civilization	13	12
Other history	22	19
Social sciences	73	66
Mathematics	57	43
Natural and physical sciences	62	53

Reference: Detailed tables 1, 13, 8 and 8.1

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[4] The reader should note that the detailed tables include information on two-year degree programs offered by **four-year** institutions. This section of the report focuses only on general education requirements offered at two-year colleges.

music history, archaeology, jurisprudence, religious studies and ethics, or interdisciplinary courses in the humanities). In nonhumanities fields, between 15 and 22 percent of the two-year colleges showed increases in minimum credit hours.

Only 11 percent of two-year colleges had some kind of foreign language requirements for all degree candidates (compared with two-fifths of four-year institutions). The average minimum credit hours in foreign language were also lower at two-year colleges than at four-year institutions (see detailed tables 7 and 10).

The survey also sought information on the extent to which institutions required coursework in specific subject areas of the humanities (e.g., American history and literature, the literature and philosophy of ancient Greece and Rome). It is interesting to note that about 4 in 10 two-year colleges reported that they required all degree candidates to take coursework in American history and literature (see detailed table 9). This is much higher than the proportion of doctoral universities (19 percent) or baccalaureate colleges (26 percent) with such a requirement. In other areas, very few two-year colleges reported any requirements.

In terms of instructional methods used in required humanities courses, 79 percent of two-year colleges relied significantly on secondary sources, 54 percent required students to write critical papers and 37 percent used selections from primary texts for one-third or more of these courses. Only 20 percent reported that students in these courses used primary texts (see detailed table 11).

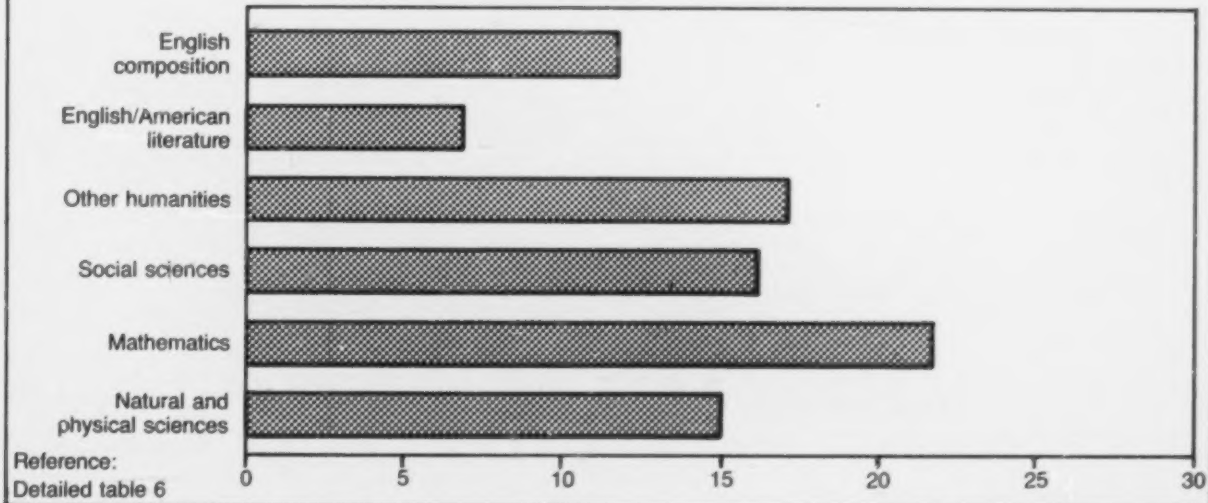
Thirty-six percent of two-year colleges required formal library training for all degree candidates. Of these colleges, one-third offered such training through an orientation by library staff, while a few required more intensive training (see detailed table 12).

As was the case with four-year institutions, the predominant method for teaching expository writing at two-year colleges was through the English department; 57 percent followed this approach. Fifty percent of two-year colleges offered a special composition program to teach expository writing, 48 percent used a writing laboratory to teach expository writing skills, 44 percent required a designated amount of critical writing in the general education courses, and 34 percent relied on the "writing across the curriculum" method. Only 25 percent required a proficiency examination (see table K).

About half of the two-year colleges were involved in restructuring their general education requirements during 1984-85; 22 percent reported being involved in the planning stages of such changes. Both of these figures suggest a lower level of activity in this area than was reported by four-year institutions. Faculty committees and deans shared the role as principal initiators of such restructuring at two-year colleges.

FIGURE 5

Percentage of Two-year Colleges Reporting Increases in the Minimum Credit Hours in Selected Fields Between 1979–80 and 1984–85



Reference:
Detailed table 6

SUMMARY

This report has offered a detailed look at general education requirements in American colleges and universities, with a particular focus on the role of humanities subject-matter in such requirements. The general view that emerges does much to support the concern voiced recently by a number of national reports regarding the low degree of coherence in the undergraduate curriculum: apart from a general consensus on a requirement for coursework in English composition, colleges ranged widely on what they designated as needed in general education.

Baccalaureate colleges offer some exception to this overall pattern. Many of these colleges do require all their students to cover specific academic areas as part of their undergraduate education. Probably, too, a comparable survey of requirements for liberal-arts majors would show a greater degree of consensus that certain subject areas should be part of an undergraduate's course of study. Nevertheless, this study—which focused on requirements applicable to all degree candidates, regardless of major--indicates that very little common learning is now signified by the granting of baccalaureate degrees in America's colleges and universities.

DETAILED TABLES

TABLE 1—Institution-wide General Education Requirements of All Degree Candidates, 1984–85

	All Institutions			Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private
Total	2,546	1,395	1,151	163	104	59	399	252	147	708	119	589	1,276	920	356
Institutions requiring general education	2,373	1,259	1,114	156	97	59	366	242	124	694	119	575	1,157	801	356
Percent	93.2	90.2	96.8	95.6	93.2	100.0	91.7	96.2	84.1	98.0	100.0	97.7	89.3	87.1	100.0
Institutions requiring no general education	173	136	37	7	7	0	33	10	23	14	0	14	119	119	0
Percent	6.8	9.8	3.2	4.4	6.8	0.0	8.3	3.8	15.9	2.0	0.0	2.3	9.2	12.9	0.0

TABLE 2—Type of General Education Requirements
(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total (N = 163)	Public (N = 104)	Private (N = 59)	Total (N = 399)	Public (N = 252)	Private (N = 147)	Total (N = 708)	Public (N = 119)	Private (N = 589)	Total (N = 1,296)	Public (N = 940)	Private (N = 356)
						1984–85						
Specified departmental	63	69	52	79	80	78	83	100	80	89	85	100
Specified interdisciplinary	15	14	16	34	36	31	31	14	34	39	32	58
Limited area	85	88	80	87	87	88	87	93	86	81	89	60
Unlimited area	22	17	32	15	13	19	13	7	14	7	8	5
						1979–80						
Specified departmental	58	64	48	78	75	83	79	79	79	83	78	97
Specified interdisciplinary	9	10	8	28	27	29	27	7	31	30	24	45
Limited area	63	60	68	76	74	80	70	64	71	71	76	55
Unlimited area	37	33	44	19	18	20	22	14	24	14	18	5

TABLE 3—General Education Requirements, by Division
(Percentage of Institutions)

	Doctorate		Comprehensive		Baccalaureate		Two-year	
Division	1984–85	1979–80	1984–85	1979–80	1984–85	1979–80	1984–85	1979–80
	(N = 163)		(N = 399)		(N = 708)		(N = 1,296)	
Lower only	30	25	29	32	21	23	90	90
Upper only	0	2	5	5	1	1	0	0
Upper and/or lower	70	73	66	63	78	76	10	10

TABLE 4—Average Hours of General Education and Average Hours for Graduation, Four-year Programs, 1984–85 and 1979–80

	All Institutions			Doctorate			Comprehensive			Baccalaureate		
	Total	Public	Private	Total	Public	private	Total	Public	Private	Total	Public	Private
Average hours of general education, 1984–85	45	42	46	39	40	39	43	42	44	47	44	48
Average hours of general education, 1979–80	42	40	44	38	39	38	41	40	42	44	39	46
Average hours for graduation, 1984–85	125	124	126	123	123	122	123	124	123	127	125	128
Average hours for graduation, 1979–80	125	125	125	126	128	124	123	125	122	126	125	127

TABLE 4.1—Average Hours of General Education and Average Hours for Graduation, Two-year Programs, 1984–85 and 1979–80

	All Institutions			Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private
Average hours of general education, 1984–85	29	26	30	34	25	36	30	26	31	26	23	27	26	26	25
Average hours of general education, 1979–80	28	24	30	34	26	36	29	22	31	24	23	25	26	25	27
Average hours for graduation, 1984–85	64	62	65	60	60	60	65	63	66	63	64	63	65	62	70
Average hours for graduation, 1979–80	64	61	65	60	63	60	64	57	66	63	64	63	66	62	69

TABLE 5—Distribution of Institutions by Percentage of Total Hours Required That Are in General Education, Four-year Programs

(Percentage of Institutions)

General Education Hours as a Percentage of Total Hours	Total Four-year Institutions 1984–85	(N = 1,270) 1979–80	Doctorate 1984–85	(N = 163) 1979–80	Comprehensive 1984–85	(N = 399) 1979–80	Baccalaureate 1984–85	(N = 708) 1979–80
0–4 percent	5	6	4	4	9	12	3	3
5–24 percent	7	12	19	26	10	9	3	10
25–34 percent	29	29	42	38	32	40	24	20
35–44 percent	44	40	19	22	36	26	54	52
45 plus percent	15	13	16	10	13	12	16	14
Total	100	100	100	100	100	100	100	100

Note: Percentage distributions may not sum to 100 because of rounding.

TABLE 5.1—Distribution of Institutions by the Percentage of Total Hours Required That Are in General Education, Two-year Programs

(Percentage of Institutions)

	Total Four-year Institutions		Doctorate		Comprehensive		Baccalaureate		Two-year	
	1984–85	1979–80	1984–85	1979–80	1984–85	1979–80	1984–85	1979–80	1984–85	'1979–80
	(N = 350)	(N = 346)	(N = 21)	(N = 21)	(N = 77)	(N = 73)	(N = 252)	(N = 252)	(N = 1,296)	
0–4 percent	1	6	11	11	0	9	0	4	0	2
5–24 percent	12	14	11	11	30	26	7	12	11	15
25–34 percent	22	18	0	0	17	14	26	21	28	26
35–44 percent	26	30	11	11	6	6	34	38	19	19
45 plus percent	38	31	67	67	46	42	34	25	42	38
Total	100	100	100	100	100	100	100	100	100	100

Note: Percentage distributions may not sum to 100 because of rounding.

TABLE 6—Changes Between 1979–80 and 1984–85 in Minimum Credit Hours Required in Selected Fields

(In Percentage)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
	Increase	No Change (N = 163)	Decrease	Increase	No Change (N = 399)	Decrease	Increase	No Change (N = 708)	Decrease	Increase	No Change (N = 1,296)	Decrease
English composition	10	87	3	11	86	3	5	95	0	12	86	2
English/American literature	4	93	3	5	91	4	16	79	5	7	87	7
Foreign language	7	90	3	4	96	0	15	79	6	0	100	0
World civilization	3	97	0	11	87	1	21	77	2	1	98	1
Other history	7	91	2	4	92	4	8	87	5	3	97	0
Philosophy	3	97	0	4	95	1	10	87	3	3	96	1
Classics	0	100	0	0	100	0	2	98	0	0	100	0
Other humanities	10	86	4	15	82	3	14	78	9	17	83	0
Arts	2	98	0	3	96	1	10	90	0	1	99	0
Social sciences	12	75	13	10	84	7	14	77	9	16	80	4
Mathematics	19	78	3	15	83	1	17	82	1	22	73	5
Natural & physical sciences	10	81	9	8	88	5	10	77	13	15	78	7
Mathematics and/or science	6	91	3	4	95	1	2	96	2	3	96	0
Combination of humanities	6	90	4	2	96	1	7	91	2	2	98	0
Humanities and/or choice of other subject areas	4	94	2	0	98	2	3	96	1	0	100	0
Other	0	98	2	0	100	0	0	100	0	0	100	0

TABLE 7—Average Minimum Credit Hours Required at Institutions with School-wide General Education Requirements, by Field, 1984–85

	Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total (N = 156)	Public (N = 97)	Private (N = 59)	Total (N = 366)	Public (N = 242)	Private (N = 124)	Total (N = 694)	Public (N = 119)	Private (N = 575)	Total (N = 1,157)	Public (N = 801)	Private (N = 356)
English composition	6	6	6	5	6	5	5	6	5	7	6	8
English/American literature	5	5	5	5	4	5	4	4	4	4	4	3
Foreign language	9	10	8	7	6	9	7	5	8	2	2	1
World civilization	6	6	7	6	5	8	4	4	4	4	6	1
Other history	4	6	3	5	5	5	4	4	4	3	5	1
Philosophy	4	4	5	5	3	9	4	3	4	3	2	6
Classics	0	0	0	1	2	0	3	3	3	0	0	0
Other humanities	8	7	8	7	7	8	9	6	10	6	5	7
Arts	3	3	4	3	4	2	4	5	4	2	3	1
Social sciences	8	8	8	8	8	8	8	10	7	5	6	4
Mathematics	5	5	5	4	4	4	4	4	4	5	5	6
Natural and physical sciences	9	9	8	7	9	6	7	8	7	6	7	5
Mathematics and/or science	8	8	8	11	11	10	10	12	9	5	6	1
Combination of humanities	10	10	10	11	12	11	13	14	12	7	10	1
Humanities and/or choice of other subject areas	19	20	18	16	13	22	10	18	8	6	6	5
Other	0	0	0	0	0	0	0	0	0	2	2	0

Note: Averages are based on responses of all institutions in each category, including those with no minimum requirements in a field.

TABLE 8—Institutions with General Education Requirements in Selected Fields, 1984–85
(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total (N = 156)	Public (N = 97)	Private (N = 59)	Total (N = 366)	Public (N = 242)	Private (N = 124)	Total (N = 694)	Public (N = 119)	Private (N = 575)	Total (N = 1,157)	Public (N = 801)	Private (N = 356)
English composition	90	93	84	84	89	71	88	100	85	90	88	100
English/American literature	28	30	24	35	31	45	54	57	54	23	25	50
Foreign language	26	18	40	22	20	26	36	14	42	5	6	11
World Civilization	17	11	28	34	32	39	52	50	52	13	15	17
Other history	19	20	16	26	28	19	27	43	23	22	26	28
Philosophy	19	14	32	26	21	39	46	14	54	7	7	11
Classics	0	0	0	1	1	0	4	14	2	0	0	0
Other humanities	41	39	44	57	57	55	68	57	71	39	42	44
Arts	4	2	8	18	17	19	29	21	31	5	6	6
Social sciences	72	68	80	75	79	71	86	79	88	73	82	67
Mathematics	51	59	36	59	61	55	50	71	44	57	63	61
Natural and physical sciences	62	64	60	67	73	52	71	71	71	62	69	61
Mathematics and/or science	22	18	28	14	12	19	20	14	21	11	12	11
Humanities combination	26	27	24	13	15	10	20	14	21	15	18	22
Humanities and/or choice of other subject areas	12	14	8	4	4	3	6	7	6	4	4	6

TABLE 8.1—Institutions with General Education Requirements in Selected Fields, 1979–80

(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total (N = 156)	Public (N = 97)	Private (N = 59)	Total (N = 366)	Public (N = 242)	Private (N = 124)	Total (N = 694)	Public (N = 119)	Private (N = 575)	Total (N = 1,157)	Public (N = 801)	Private (N = 356)
English composition	86	86	84	77	84	61	85	93	83	84	83	89
English/American literature	23	27	16	30	27	39	42	43	42	20	15	50
Foreign language	19	16	24	17	16	19	26	7	31	5	4	11
World civilization	14	11	20	24	23	29	33	29	35	12	12	11
Other history	13	16	8	24	28	16	23	36	19	19	20	17
Philosophy	16	11	24	21	17	29	36	0	46	3	2	11
Classics	0	0	0	1	1	0	2	0	2	0	0	0
Other humanities	36	36	36	47	48	45	62	57	64	33	33	33
Arts	3	0	8	15	15	16	20	14	21	5	4	6
Social sciences	70	68	72	74	76	71	79	71	81	66	68	56
Mathematics	36	41	28	45	48	39	33	50	29	43	42	44
Natural and physical sciences	55	59	48	64	69	52	64	57	65	53	54	50
Mathematics and/or science	19	14	28	12	11	16	20	14	21	10	10	11
Humanities combination	26	25	28	13	15	10	18	7	21	13	12	17
Humanities and/or choice of other areas	9	9	8	4	4	3	4	7	4	4	4	6

TABLE 9—Institutions that Require Students to Take One or More Courses Covering Various Humanities Areas, 1984–85

(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
Content	Total (N = 163)	Public (N = 104)	Private (N = 59)	Total (N = 399)	Public (N = 252)	Private (N = 147)	Total (N = 708)	Public (N = 119)	Private (N = 589)	Total (N = 1,296)	Public (N = 940)	Private (N = 356)
Ancient or medieval European history	9	10	8	17	12	30	26	21	27	4	4	5
European history from the Renaissance	11	10	12	19	11	31	31	21	33	6	5	8
American history and literature	19	27	4	35	42	22	26	29	26	39	28	42
Literature and philosophy of ancient Greece and Rome	8	10	4	7	8	7	19	0	22	7	4	16
Literature, history, or cultures of Africa or Asia	14	15	12	7	5	10	8	0	10	2	2	0

TABLE 10—Institutions with Foreign Language Study Graduation Requirements for All Degree Candidates, 1984–85

(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
Requirement	Total (N = 163)	Public (N = 104)	Private (N = 59)	Total (N = 399)	Public (N = 252)	Private (N = 147)	Total (N = 708)	Public (N = 119)	Private (N = 589)	Total (N = 1,296)	Public (N = 940)	Private (N = 356)
Foreign language study is required	39	31	52	41	28	62	48	29	52	11	13	5
Specified courses	21	21	20	19	17	21	20	14	21	3	3	3
Proficiency examination	7	5	12	6	3	12	3	0	4	0	0	0
Computer substitute	3	5	0	2	0	7	9	7	10	0	0	0
Other substitutions	3	2	4	8	6	12	18	0	22	3	4	0
Specific courses and/or proficiency examination	13	10	20	10	9	12	10	7	11	0	0	0

TABLE 11—Institutions Using Various Instructional Methods in One-third or More of Required Humanities Courses, 1984–85

(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
Method	Total (N = 163)	Public (N = 104)	Private (N = 59)	Total (N = 399)	Public (N = 252)	Private (N = 147)	Total (N = 708)	Public (N = 119)	Private (N = 589)	Total (N = 1,296)	Public (N = 940)	Private (N = 356)
Primary texts	47	38	64	41	38	50	40	65	33	20	20	22
Selections from primary texts	56	50	68	63	58	77	72	65	74	37	35	50
Secondary sources	68	73	59	73	75	69	90	100	88	79	77	89
Write critical papers	63	60	68	60	52	81	72	65	74	54	53	61
Original research	17	14	20	17	10	38	25	22	26	8	8	11

TABLE 12—Institutions Requiring Formal Library Training for All Undergraduates, 1984–85

(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
Training Type	Total (N = 163)	Public (N = 104)	Private (N = 59)	Total (N = 399)	Public (N = 252)	Private (N = 147)	Total (N = 708)	Public (N = 119)	Private (N = 589)	Total (N = 1,296)	Public (N = 940)	Private (N = 356)
Formal training required	22	20	24	32	30	35	56	50	57	36	30	52
Orientation	16	14	20	26	24	29	53	43	56	34	29	47
Intensive training	3	2	4	14	13	17	26	7	29	12	10	18
Other	4	7	0	4	4	4	7	14	6	2	2	3

TABLE 13—Institutions Reporting the Use of Various Approaches to the Teaching of Expository Writing, 1984–85

(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total (N = 163)	Public (N = 104)	Private (N = 59)	Total (N = 399)	Public (N = 252)	Private (N = 147)	Total (N = 708)	Public (N = 119)	Private (N = 589)	Total (N = 1,296)	Public (N = 940)	Private (N = 356)
English department only	42	41	44	46	48	44	47	64	43	57	64	37
Composition program	68	73	60	72	75	67	57	57	56	50	53	42
Writing laboratory	61	70	44	66	74	52	49	86	41	48	55	29
Peer tutorial	22	30	8	41	39	45	31	43	29	21	25	10
Across the curriculum	36	30	48	43	37	52	43	29	46	34	24	61
Designated amount of critical writing	47	50	41	35	29	46	44	15	50	44	36	66
Proficiency examination	28	32	20	34	41	22	25	14	28	25	25	26
Optional thesis	68	70	64	48	38	64	52	14	59	2	3	0
Mandatory senior thesis	3	0	8	1	1	1	10	0	12	1	2	0

TABLE 14—Institutions Reporting Restructuring of General Education Requirements, 1984–85

(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total (N = 163)	Public (N = 104)	Private (N = 59)	Total (N = 399)	Public (N = 252)	Private (N = 147)	Total (N = 708)	Public (N = 119)	Private (N = 589)	Total (N = 1,296)	Public (N = 940)	Private (N = 356)
Not being considered	39	33	49	42	40	46	48	36	50	52	53	50
In planning stage	34	35	32	30	25	39	25	36	23	22	23	18
In process	23	30	12	21	27	10	18	14	19	21	16	32
Just completed	4	2	8	6	8	4	8	14	7	5	7	0

TABLE 14.1—Institutions Reporting Restructuring of General Education Requirements, by Initiator, 1984–85

(Percentage of Institutions)

	Doctorate			Comprehensive			Baccalaureate			Two-year		
	Total (N = 102)	Public (N = 69)	Private (N = 33)	Total (N = 219)	Public (N = 134)	Private (N = 85)	Total (N = 361)	Public (N = 68)	Private (N = 293)	Total (N = 585)	Public (N = 397)	Private (N = 188)
Faculty committee	28	28	29	44	39	52	37	25	39	42	46	35
Faculty senate	7	10	0	12	14	8	2	0	3	0	0	0
Dean	30	31	29	20	10	35	42	38	44	37	26	60
President	5	3	7	18	26	5	9	25	5	5	8	0
Other	30	28	36	7	11	0	10	12	9	16	21	5

Note: Percentage based on institutions reporting a restructuring of requirements.

APPENDIX A: SURVEY INSTRUMENT

AMERICAN COUNCIL ON EDUCATION
Higher Education Panel

July 11, 1984

Dear Higher Education Panel Representative:

Attached is Higher Education Panel Survey No. 66, "General Education Requirements in the Humanities." It is sponsored by the National Endowment for the Humanities for the purpose of determining the status of undergraduate general education requirements in the humanities at colleges and universities throughout the country.

In recent years, some observers of higher education have perceived a decline in the importance of the humanities in general education. The Endowment is seeking to assess this trend and to strengthen the teaching and learning of the humanities at the undergraduate level. This survey will aid the Endowment by providing reliable data that are needed to develop effective program policies, guidelines, and priorities.

This survey may be most appropriately completed by the dean of undergraduate education at larger institutions or by the dean of the college at smaller institutions. However, we rely on your determination of the most appropriate respondent.

Please understand that your institution's response will be protected to the maximum extent permissible by law. As with all our surveys, the data you provide will be reported in summary fashion only and will not be identifiable with your institution. This survey is authorized by the National Science Foundation Act of 1950, as amended. Although you are not required to respond, your cooperation is needed to make the results comprehensive, reliable, and timely.

Please have the completed questionnaire returned to us by **August 1,** enclosed in the postpaid, preaddressed envelope.

If you have any problems or questions, please do not hesitate to telephone us collect at (202) 833-4757. Thank you for your assistance.

Sincerely,

Frank J. Atelsek

Frank J. Atelsek
Panel Director

Enclosure

AMERICAN
COUNCIL ON
EDUCATION

OMB # 3145-0009
Exp. 03/31/87

Higher Education Panel Survey #66

GENERAL EDUCATION REQUIREMENTS IN THE HUMANITIES

NOTE

For the purposes of this questionnaire, "general education" is defined as that part of the curriculum that all undergraduates are required to take, regardless of major, in order to graduate. Often referred to as the "breadth" of component of the curriculum, general education is distinct from the "depth" major, and from free electives. Some institutions require students to take a specific set or "core" of general education courses. Other institutions adopt a distribution scheme whereby students can select from groups of courses to complete the general education requirements.

All questions refer to requirements in effect for students entering in the 1984–85 academic year unless otherwise indicated. Humanities includes modern and classical languages; linguistics; English; literature; history; American studies; philosophy; archaeology; religious studies; and the history, criticism, and theory of the arts.

If your institution does not have an undergraduate program, please check the box ☐ and return the questionnaire uncompleted to us.

1. Are there any course requirements that all undergraduate degree candidates must meet to graduate, regardless of major?
   ____ Yes. Proceed to question 2.
   ____ No. Skip to question 9.

2. Please indicate which of the following conditions describes your current general education requirements and whether they existed during the 1979–80 academic year. Check *all* that apply.

	Part of 1984–85 Requirements	Part of 1979–80 Requirements
a. Students must take one or more specified departmental courses, e.g., "history 101."	____ Yes ____ No	____ Yes ____ No
b. Students must take one or more specified interdisciplinary or interdepartmental courses.	____ Yes ____ No	____ Yes ____ No
c. Students must choose from a limited range of courses to fulfill area requirements.	____ Yes ____ No	____ Yes ____ No
d. Students must choose from a virtually unlimited range of courses to fulfill area requirements.	____ Yes ____ No	____ Yes ____ No

3. Please indicate during which years students usually complete the general education requirements.

	1984–85	1979–80
Lower division only	____	____
Upper division only	____	____
Upper and/or lower division	____	____

4. Indicate the minimum number of credit hours required of general education and the *total* number of hours required for graduation from the:

	1984–85	1979–80
(a) **Four-year baccalaureate program** (check here ☐ if not applicable)		
Required only in general education:	____ hours	____ hours
Total required for graduation:	____ hours	____ hours
(b) **Two-year associate program** (check here ☐ if not applicable)		
Required only in general education:	____ hours	____ hours
Total required for graduation:	____ hours	____ hours

(c) Indicate whether these totals are based on a quarter or semester system.	1984–85	1979–80
Quarter	________	________
Semester	________	________
Other (specify):	________	________

____

The following questions should be answered for four-year programs whenever possible. If your institution offers only a two-year program, then provide responses for the two-year program.

5. For each of the following academic areas, indicate the minimum number of credit hours (either quarter or semester) required of all degree candidates entering in 1984–85 and in 1979–80.

The humanities:	Credit Hour Requirements 1984–85	Credit Hour Requirements 1979–1980
a. English composition	________	________
b. English or American literature	________	________
c. Foreign languages and literature	________	________
d. World or Western civilization	________	________
e. Other history	________	________
f. Philosophy	________	________
g. Classics	________	________

	Credit Hour Requirements 1984–85	Credit Hour Requirements 1979–1980
h. Other humanities fields,* including interdisciplinary humanities courses	________	________
Other fields:		
i. Studio and performing arts	________	________
j. Social sciences	________	________
k. Mathematics	________	________
l. Natural and physical sciences	________	________

6. In order to graduate, *must* a student take one or more courses that include substantial content in:

Ancient or medieval European history _____ Yes _____ No

European history from the Renaissance _____ Yes _____ No

American history and literature _____ Yes _____ No

Literature and philosophy of ancient Greece and Rome _____ Yes _____ No

Literature, history, or cultures of Africa or Asia _____ Yes _____ No

7. Which of the following best describe your institution's foreign language graduation requirement for all undergraduates? Check *all* that apply.

☐ There are no foreign language requirements of any kind.
☐ A specified number of courses or hours are required.
☐ A language proficiency examination must be passed.
☐ Computer courses may be substituted for foreign language courses.
☐ Other courses may be substituted for foreign language courses (specify): ____________________
☐ Other foreign language requirement (specify): ____________________
____

8. How many humanities courses taken to fulfill general education requirements demand that students:

	Two-thirds or More Courses	Between One-third and Two-thirds Courses	One-third or Fewer Courses or None	Do Not Know
(a) Read primary literary, historical, or critical texts in their entirety	______	______	______	______
(b) Read selections from primary literary, historical, or critical texts	______	______	______	______
(c) Read textbooks and other secondary sources	______	______	______	______
(d) Write critical papers	______	______	______	______
(e) Conduct original research from primary sources	______	______	______	______

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*Linguistics, art history, music history, archaeology, jurisprudence, and religious studies and ethics, as well as interdisciplinary courses whose content is primarily the humanities.

THE QUESTIONNAIRE IS CONTINUED ON THE FOLLOWING PAGE.

9. Are all undergraduate students required to take formal training in the use of the college library for research?

________ Yes ________ No

If yes, which of the following describe the required training? Check *all* that apply.

☐ Orientation by the library staff

☐ More intensive training in the use of library resources involving faculty

☐ Other (specify) ________________________________

10. Which of the following describe your approach to the teaching of expository writing skills to undergraduates? Check *all* that apply

Writing is taught only in the English department. _____ Yes _____ No

Writing is taught in a special composition program. _____ Yes _____ No

Writing is taught in a writing laboratory. _____ Yes _____ No

Writing is taught using a peer tutorial system _____ Yes _____ No

Writing is taught in a "writing across the curriculum" program, i.e., in all or most academic departments. _____ Yes _____ No

Students are responsible for a designated amount of critical writing in the general education courses. _____ Yes _____ No

Students must pass a writing proficiency examination. _____ Yes _____ No

Students *may* write a senior thesis. _____ Yes _____ No

Students *must* write a senior thesis. _____ Yes _____ No

11. Is your institution currently restructuring or planning to restructure the general education requirements? (Check only one.)

(a) No, not under active consideration ____________________

(b) Yes, restructuring is in active planning stage ____________

(c) Yes, restructuring is in process ____________________

If you checked "b" or "c," who within your institution was the principal initiator of the restructuring? (Check only one.)

☐ Faculty committee

☐ Faculty senate

☐ Dean

☐ President

☐ Other (specify) ________________________________

Thank you for your assistance. Please return this form by **August 1** to:

Higher Education Panel
American Council on Education
One Dupont Circle, Suite 829
Washington, DC 20036

Please keep a copy of this survey for your records.

Person completing form:

Name ________________________________

Title ________________________________

Telephone (______) ________________________

If you have any questions or problems concerning this survey, please call the HEP staff collect at (202) 833-4757.

APPENDIX B: TECHNICAL NOTES

Questionnaires were sent to 445 universities, four-year institutions, and two-year colleges from one of the Panel's 520-institution half-samples. Excluded from the survey were institutions offering only graduate and/or first-professional degrees, such as those in medicine, the allied health professions, law, theology, business, and the studio and performing arts. Responses were received from 372 of the institutions survyed for an overall response rate of 84 percent. Table B-1 shows the stratification design, the population, and the number of responses.

Comparison of Respondents and Nonrespondents

Respondent institutions are compared with Panel nonrespondents against several characteristics in table B-2. Generally, the larger institutions (with undergraduate full-time enrollment of 10,000 students or more) showed a relatively high response rate (90 percent). Universities overall and public universities in particular had high response rates (87 and 88 percent, respectively), as did institutions in the South (89 percent). Institutions showing relatively low response rates were the two-year colleges (78 percent), especially the private two-year colleges (72 percent), and institutions in the West (76 percent).

TABLE B-2—Comparison of Respondents and Nonrespondents

(In Percentages)

Characteristic	Respondents (N = 372)	Non-Respondents (N = 73)	Response Rate
Total	100.0	100.0	84
Control			
Public	66	68	83
Private	34	32	85
Type			
Universities	18	14	87
Four-year colleges	46	37	86
Two-year colleges	35	50	78
Control and Type			
Public universities	12	8	88
Private universities	7	6	86
Public four-year colleges	24	20	86
Private four-year colleges	22	16	87
Public two-year colleges	30	40	80
Private two-year colleges	5	10	72
Region			
Northeast	22	25	82
Midwest	26	23	85
South	34	22	89
West	18	30	76
Undergraduate FTE Enrollment			
Less than 2,000	34	36	83
2,000–5,999	30	33	82
5,000–9,999	18	20	82
10,000 or more	18	11	90

TABLE B-1—Stratification Design

Cell		Population (N = 2,566)	Respondents (N = 372)
01	Public doctoral universities, FTE 9,000+	104	44
02	Private doctoral universities, FTE 9,000+	61	25
03	Public comprehensive, FTE 9,000+	92	38
04	Private comprehensive, FTE 9,000+	27	12
07	Public two-year academic/occupational, FTE 9,000+	43	15
08	Public comprehensive, FTE 5,500–8,999	56	17
09	Public comprehensive, FTE<5,500	108	20
10	Private comprehensive, FTE<9,000	126	19
11	Public baccalaureate, FTE<9,000	127	14
12	Private baccalaureate, FTE 1,350–8,999	166	21
13	Private baccalaureate, FTE<1,350	446	31
17	Public two-year academic/comprehensive, FTE 6,000–8,999	55	14
18	Public two-year academic/comprehensive, FTE 4,000–5,999	72	16
19	Public two-year academic/comprehensive, FTE 2,000–3,999	155	18
20	Public two-year academic/comprehensive, FTE<2,000	333	21
21	Private two-year academic/comprehensive, FTE<9,000	129	13
22	Public two-year occupational, FTE 2,500–8,999	63	11
23	Public two-year occupational, FTE<2,500	221	18
24	Private two-year occupational, FTE<9,000	240	5

Reliability of Survey Estimates

The figures in this survey are estimates based on a sample designed to yield information for an entire population. Were a census of the population to be taken, using the same survey instrument, instructions, and procedures as those used in this survey, the resulting figures would be somewhat different. The results are also subject to reporting and processing errors and errors due to nonresponse. To the extent possible, these types of errors were kept to a minimum by methods built into the survey procedures.

A means of gauging the accuracy of these estimates is the use of the standard error, which is primarily a measure of sampling variability—the variations that might occur by chance because only a sample of institutions is surveyed. The chances are about 68 out of 100 that an estimate from the sample would differ from a complete census by less than the standard error. The chances are about 90 out of 100 that it would be less than 1.65 times the standard error and 99 out of 100 that it would be less than 2.5 times as large. Knowledge of the standard error permits researchers to specify, by a stated confidence, a range within which a given estimate would lie if a complete census, rather than a sample survey, had been conducted.

For example, the estimated number of credit hours of general education required by four-year bachelor's programs in 1984–85 was 45 hours. Table B-3 shows that the confidence limit at the 90 percent level of confidence is ± 1.3 hours. Thus, chances are about 90 out of 100 that a complete census would show the number of general education credit hours at all four-year institutions to be more than 43.7 and less than 46.3.

Table B-3 shows the 90 percent confidence intervals of selected survey estimates.

TABLE B-3—Ninety Percent Confidence Intervals (+ or −) of Selected Survey Estimates
(In Hours)

Credit Hours	1984–85	1979–80	1984–85	1979–80	1984–85	1979–80
Four-year bachelor's program						
General education only	1.3	1.6	1.5	1.7	1.8	2.4
Graduation total	1.5	1.3	0.5	0.5	2.4	2.0
Two-year program						
General education only	1.6	1.7	1.7	1.8	3.0	3.3
Graduation total	0.9	1.2	0.7	1.5	1.9	1.9
English composition	0.2	0.3	0.3	0.3	0.4	0.4
English/American literature	0.2	0.2	0.2	0.3	0.4	0.4
Foreign language	0.2	0.2	0.2	0.2	0.5	0.5
World civilization	0.2	0.2	0.2	0.2	0.4	0.3
Philosophy	0.2	0.2	0.1	0.04	0.6	0.6
Classics	0.04	0.04	0.04	0.02	0.1	0.1

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Higher Education Panel Survey Number 66

GENERAL EDUCATION REQUIREMENTS IN THE HUMANITIES

ERRATA

Page 7, right column, line 7: For 58 percent read 19 percent
Page 7, For TABLE F read

TABLE F--Percentage of Four-year Institutions with Foreign Language Requirements for All Undergraduates, 1984-85

	Doctorate Institutions (N = 163)	Comprehensive Institutions (N = 399)	Baccalaureate Institutions (N = 708)
Percentage with foreign language requirements	39%	41%	48%
Number of four-year institutions with foreign language requirements	(N = 63)	(N = 162)	(N = 341)
Specified courses	54%	46%	41%
Proficiency examinations	19	16	6
Substitutions, computer courses	8	6	19
Substitutions, other (areas studies, other humanities, etc.)	8	21	38
Other foreign language requirements (proficiency or course-work, transfer credits, etc.)	35	25	22

Note: Multiple responses were permitted; therefore, detail will total to more than 100 percent. These figures were recalculated from data in detailed table 10.